**National Park Service**
**U.S. Department of the Interior**

**Wrangell-St. Elias National Park and Preserve**
**Alaska**

# Kennecott Mines Support Facility Plan
## *Environmental Assessment*
October 2005

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**Note to Reviewers**

If you wish to comment on this document, you may mail or e-mail comments during the 30-day public comment period, to:

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You may also provide comments online at the NPS Planning, Environment, and Public Comment website at http://parkplanning.nps.gov .

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AAC | Alaska Administrative Code |
| ADEC | Alaska Department of Environmental Conservation |
| ADF&G | Alaska Department of Fish and Game |
| ADOT&PF | Alaska Department of Transportation and Public Facilities |
| ANILCA | Alaska National Interest Lands Conservation Act |
| BMPs | Best Management Practices |
| CAA | Clean Air Act |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| CLR | Cultural Landscape Report |
| CWA | Clean Water Act |
| DNR | Alaska Department of Natural Resources |
| DO | NPS Director's Order |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EMS | Emergency Medical Services |
| FHWA | Federal Highway Administration |
| FMP | Fire Management Plan |
| GMP | General Management Plan |
| IOP | Interim Operations Plan |
| LDN | Land Design North |
| LWD | Large Woody Debris |
| MP | Mile Post |
| NEPA | National Environmental Policy Act |
| NHL | National Historic Landmark |
| NHLP | National Historic Landmark Program |
| NHPA | National Historic Preservation Act |
| NOI | Notice of Intent |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| PMIS | Project Management Information System |
| RV | Recreational Vehicle |
| SCP | Scenic Corridor Plan |
| SWPPP | Storm Water Pollution Prevention Plan |
| PWS | Public Water System |
| USCB | United States Census Bureau |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WRST | Wrangell-St. Elias National Park and Preserve |

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# 1.0 PURPOSE AND NEED FOR ACTION

## 1.1 PURPOSE OF ACTION

The National Park Service (NPS) is proposing to develop a Support Facility Plan (SFP) for the Kennecott Mines National Historic Landmark (NHL) within Wrangell-Saint Elias National Park (WRST). See Figures 1-1 and 1-2 for location and vicinity maps. The NHL preserves a diverse array of historic mining-era buildings and artifacts as well as the ongoing aspects of life in an Alaskan bush community. The purpose of the proposed plan is to support park operations and improve visitor services within the planning area by siting facilities both inside the NHL and along the last section of McCarthy Road corridor. This would include providing an efficient, cost-effective way to move supplies to the area for stabilization of historic structures, reliable transportation of visitors and park staff between the end of the McCarthy Road and the NHL, water and power utilities, facilities where visitors can obtain information and services, and NPS housing and administrative facilities.

This plan will amend the 1986 WRST General Management Plan (GMP) and will complement the 2000 Kennecott NHL Interim Operations Plan (IOP) and the 2001 Cultural Landscape Report (CLR) for Kennecott Mill Town. Complete descriptions of this proposed action, as well as a no-action alternative, are included in Chapter 2.

### 1.1.1 Plan Objectives

Specific objectives for this plan are as follows:

Visitor Opportunities

- Visitors easily find their way to the NHL and adjacent points of interest. Efficient visitor transportation and parking are provided on lands adjacent to the NHL.
- Adequate public restrooms.
- An appropriate level of visitor contact and interpretive facilities are provided outside the NHL.
- Trails to access the NHL and to provide additional recreational opportunities are adequate.

Cultural Resources Management

- Cultural resources in the planning area are managed and protected in support of the area's historical heritage.

Natural Resources Management

- Stabilize Lower National Creek to protect historic structures and cultural landscape values.

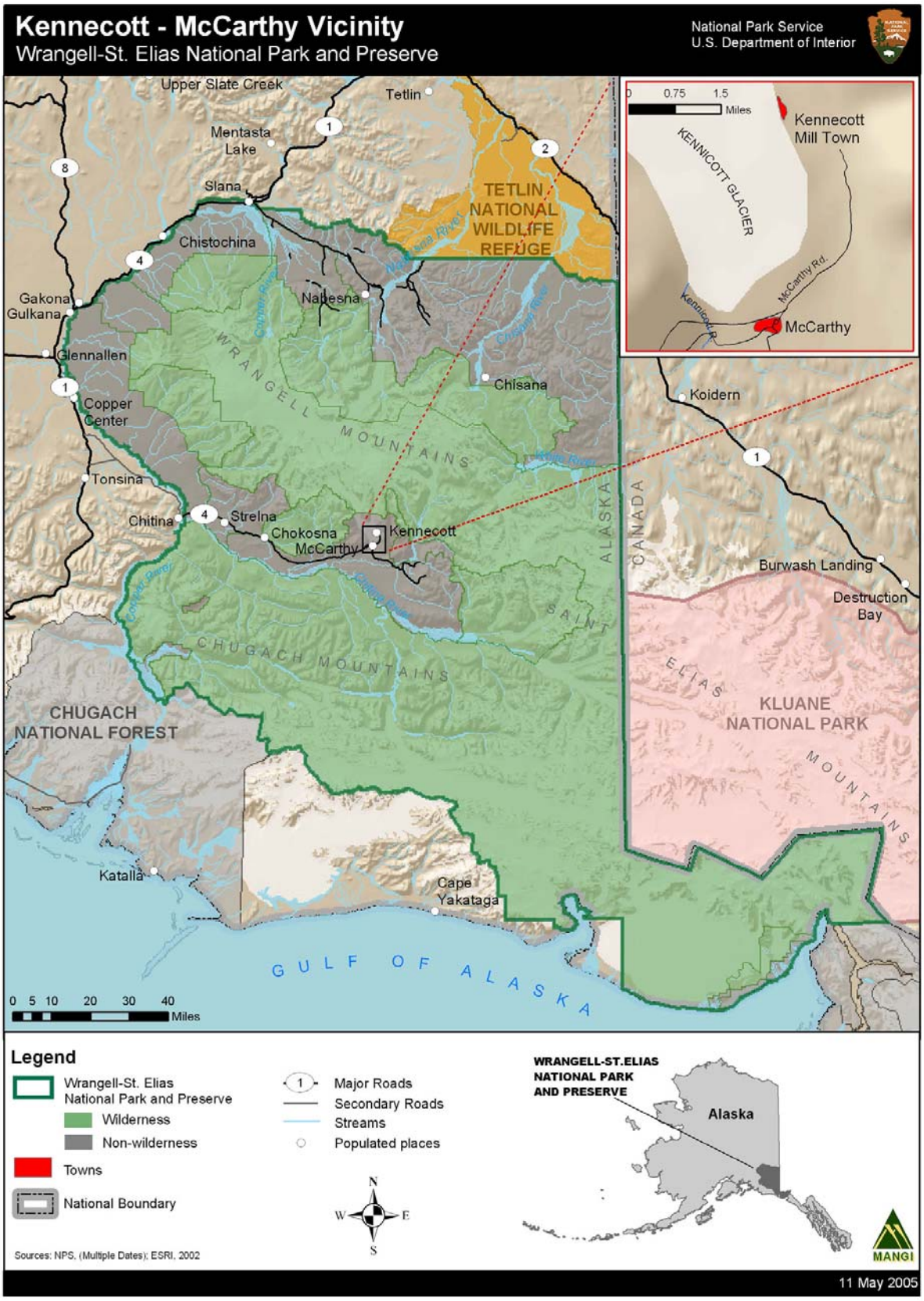



**Figure 1-1. Project Vicinity Map**

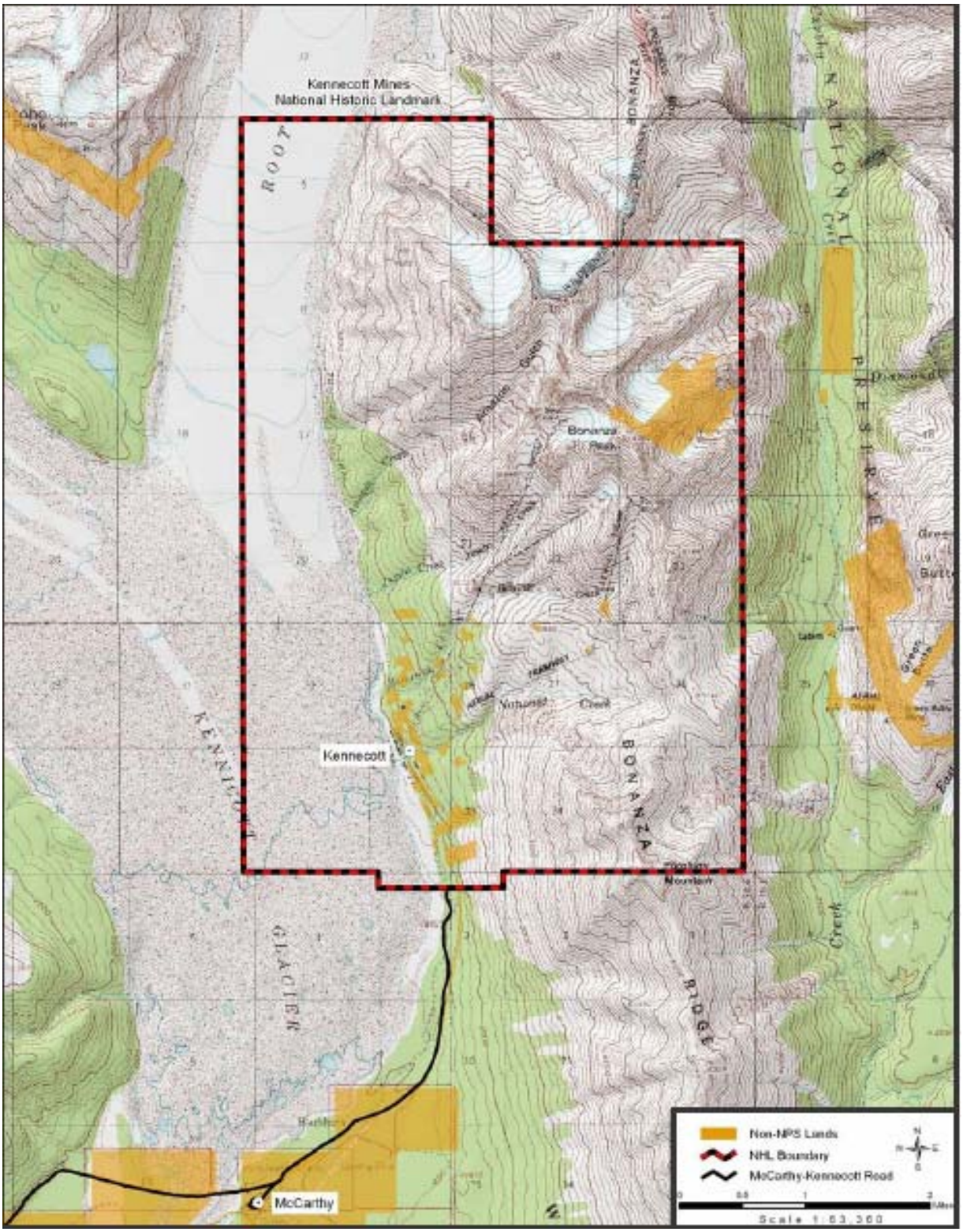



**Figure 1-2. Project Location Map**

NPS Operations

- Housing accommodates NPS/contractor staff.
- Office space accommodates NPS staff.
- Efficient employee transportation is available between work sites and housing.
- Adequate area for staging, storage, and lay-down operations, and efficient freight and materials transportation to and from worksites.
- Sewer, electricity, and water services meet utility codes and NPS operation requirements.
- Solid waste disposal facilities meet NPS and possibly community needs.
- Adequate fire and EMS services.
- Efficient NPS communications system.
- Fuel is safely stored and transported.
- Adequate NPS aircraft support facilities.
- Adequate security protects NPS property.
- Roads are maintained in a cost-effective manner within the NHL, possibly in partnership with the community.
- Signage throughout the planning area has a cohesive and compatible design theme.

## 1.2 NEED FOR THE PLAN

This plan will amend the existing WRST GMP and complement the 2000 Kennecott IOP and 2001 CLR for Kennecott Mill Town. The plan is needed to protect important historic, cultural, natural, and community resources in the planning area, and provide a rewarding park experience for visitors and residents alike. The Kennecott Mines NHL is a highly popular attraction for park visitors, and the NPS needs a support facility plan that guides development, responds to growing demands for visitor services, and is sensitive to historic preservation, community, and environmental concerns.

While cultural resources within the NHL have been extensively documented and management policies codified in the CLR, cultural resources in the adjacent area have not received the same attention. Many of these adjacent resources would be contributing elements to the NHL, and their preservation and interpretation should be addressed.

Recent NPS research in the area documented frequent encounters between bears, visitors, and areas residents. Certain recommendations from the study are in the process of being implemented. Other recommendations await implementation due to the collaborative nature of the activities and the needed participation of state and community organizations.

Another resource issue concerns two streams within the NHL: Bonanza and National Creeks. The former was identified for drinking water and fire suppression in the same utility needs assessment. These recommendations need to be analyzed before implementation decisions are made.

The spread of invasive plant species is also a natural resources concern both within and adjacent to the NHL. Initial inventories have documented an increasing infestation of dandelions and other invasive plant species along travel corridors.

Visitor amenities in the area adjacent to the NHL need to be unified in a comprehensive way. Currently, parking information services, interpretive programs, camping and lodging opportunities, and hiking opportunities are provide by NPS, state, non-profit and private entities. Bringing these organizations together to address these issues is desirable, especially in the light of the postponement of certain NPS and state projects.

In 1999, the Alaska Department of Transportation and Public Facilities (ADOT&PF) agreed to partner with NPS to prepare a Scenic Corridor Plan (SCP) for the access road between McCarthy and the NHL. An SCP had already been prepared for the rest of the McCarthy Road in cooperation with the NPS, State of Alaska, and local residents. This new SCP would complete the SCP for the entire road and would also be a cooperative venture. The SCP would serve to protect cultural resources within the NHL by seeking ways to minimize traffic congestion and to improve an existing shuttle system. This SCP would provide the basis for the NPS and State of Alaska to improve this section of road to provide for visitor safety and determine what and where visitor services should be located for the enjoyment of the park and NHL. It would also provide continued access for local residents.

With the start of this Support Facility Plan / Environmental Assessment for the NHL, it would seem that there would be a certain amount of redundancy in continuing with the above SCP. Accordingly, the Alternative Transportation Program (ATP) Manager for the NPS has suggested that the two efforts be combined and funds sought toward this new effort. Should additional funds be added, the project agreement will be amended to reflect such an addition.

This Environmental Assessment (EA) analyzes the potential environmental impacts which could result from the alternatives considered, including the No Action alternative. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council of Environmental Quality (CEQ) (40 Code of Federal Regulations 1508.9), and the NPS NEPA compliance guidance handbook (Director's Order (DO)-12, *Conservation Planning, Environmental Impact Analysis, and Decision-making*).

## 1.3 PURPOSE AND SIGNIFICANCE OF THE PARK

Wrangell-St. Elias National Park and Preserve was established by the Alaska National Interest Lands Conservation Act (ANILCA, PL 96-487) on December 2, 1980. WRST encompasses 13.2 million acres of superlative scenery, abundant wildlife, and fascinating human history and is the national park system's largest unit. The WRST Wilderness is also the largest unit of the national wilderness preservation system. In conjunction with Kluane National Park in Canada (Figure 1-2), the two areas encompass the largest parkland in North America (NPS, 1986).

The general purposes of the conservation system units established under ANILCA, defined in sections 101 (a), (b), and (c), are as follows:

- To preserve for the benefit, use, education, and inspiration of present and future generations, certain lands and waters in the state of Alaska that contain nationally significant natural, scenic, historic, archeological, geological, scientific, wilderness, cultural, recreational, and wildlife values.

- To preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered Arctic tundra, boreal forest, and coastal rainforest ecosystems; to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large Arctic and sub-Arctic wildlands and on free flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

**Figure 1-3. Mt. Saint Elias**

- Consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.

Mt. Saint Elias itself is the second-highest mountain in both the United States and Canada (the border runs over the summit), and the fourth-highest in North America. Its summit, climbing 18,008 ft. into the sky (three and half miles above sea level) within a dozen miles of the Gulf of Alaska's Icy Bay, displays some of the greatest topographic relief (the difference between the elevations of base and summit) of any mountain in the world (Figure 1-3).

The Kennecott Mines was designated a National Historic Landmark on June 23, 1986. Its Statement of Significance reads:

> A vestige of an early 20th-century copper mining camp, Kennecott represents the mining techniques of the era. The mines here were among the nation's largest and contained the last of the great high-grade copper ore deposits of the American West. The world's first ammonia-leaching plant for extracting concentrations of ore from low-grade ores was designed and first successfully used on a commercial scale here. The camp is little changed since its 1938 closing.

## 1.4 LAWS, REGULATIONS, AND POLICIES

The following laws and associated regulations provided guidance for the development of this EA, design of the Preferred Alternative and alternatives, analysis of impacts, and creation of mitigation measures to be implemented as part of the Preferred Alternative.

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The NPS 2001 Management Policies and Director's Order #55 use the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park was established and is managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities to enjoy them.

The evaluation of whether impacts of a Preferred Alternative would lead to an impairment of park resources and values is included in this EA. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's GMP or other relevant NPS planning documents.

Section 201(a) of ANILCA states that the park will be managed for the following purposes, among others:

> to maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state; to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals; and to provide continued opportunities, including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the park, where such uses are traditional in accordance with the provisions of title VIII.

Executive Order 11990, *Protection of Wetlands*, directs the NPS to avoid, to the extent possible, the short- and long-term adverse impacts associated with modifying or occupying wetlands, and requires Federal agencies to follow avoidance, mitigation, and preservation procedures regarding wetlands with public input before proposing new construction projects.

The purpose of the Clean Water Act of 1972 (CWA) (33 USC 1251 et seq.) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Section 404 of the CWA regulates the discharge of pollutants, including dredged or fill material, into navigable waters of the U.S., including wetlands, through a permit system jointly administered by the U.S.

Environmental Protection Agency (USEPA) and the U.S. Army Corps of Engineers (USACE). The regulatory definition of Section 404 jurisdictional wetlands is: "*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*."

The National Park Service Omnibus Management Act of 1998 (P.L. 105-391, 112 Statute 3497) addresses resources inventory and management in Title II. Section 201 defines the purposes of this title to enhance and encourage scientific study in National Park System (NPS) units. Section 202 authorizes and directs the Secretary of the Interior to assure management is enhanced of NPS units by a broad program of high-quality science and information. Section 205 states the Secretary may solicit, receive, and consider requests from Federal and non-Federal public or private entities for the use of NPS units for scientific study. Such proposals must be: 1) consistent with applicable laws and the NPS Management Policies; and 2) the study would be conducted in a manner as to pose no threat to park resources or public enjoyment of those resources.

## 1.5 PREVIOUS PLANNING FOR THE KENNECOTT-McCARTHY AREA

The NPS acquired the Kennecott NHL in 1998. In 2000, an Interim Operations Plan and GMP amendment for the NHL was completed; in 2001, this IOP was folded into an extensive Cultural Landscape Report. Together, these documents describe the management philosophy, management zones, and a treatment plan and recommendations for the preservation and enhancement of the NHL. The report provided overall direction for infrastructure and support facilities and outlined a variety of alternatives. However, until more information was gathered, specific decisions were not made regarding these activities.

The 2000 IOP for the Kennecott NHL calls for stabilization, preservation and adaptive reuse of the 16 historic buildings within the NHL. This program has been initiated. Projects currently underway include the renovation of the Kennecott Company Store and School. Rehabilitation of the National Creek bridge is slated to begin in FY05/06. Future phases of the line-item construction program include historic building stabilization and preservation, utility infrastructure development (power, sewer, fire protection, stormwater), hazardous materials mitigation, construction of site maintenance facility, transportation and pathway rehabilitation and improvements, and interpretive exhibits. The support facilities considered in this EA are necessary to provide the NPS infrastructure to conduct this stabilization and preservation program, and eventually to manage the NHL in perpetuity.

GMP and other guidance for support facilities are limited. At the time the IOP was completed, there was a considerable lack of information concerning the feasibility of alternatives. Since then additional data for the Kennecott Mines NHL have been gathered such as an A&E contractor-prepared feasibility plan for possible utility systems. Park staff has completed an analysis of employee housing and staffing and has assessed the need for public camping in the area. Other issues, such as solid waste removal and fuel storage, have not yet been addressed.

As early as 1981, a historic preservation plan had been prepared for Kennecott (Sullivan, 1981). The Kennecott-McCarthy area is covered by a number of previous planning efforts and documents, which are summarized in this section.

### 1.5.1 General Management Plan for Wrangell-St. Elias National Park (1986)

The 1986 General Management Plan (GMP) for WRST mentions the area in several places:

- Three sites in the area are identified as containing privately-owned cultural resources listed on the National Register of Historic Places, specifically the Kennecott historic district, McCarthy general store, and McCarthy powerhouse. The GMP states that, "The Park Service will encourage the owners of these sites and any other historic resources to protect and preserve them and will provide technical assistance when requested." Since the 1986 publication of the GMP, the Kennecott Mine and Mill Town has also been accorded National Historic Landmark status, and NPS has acquired more than 2,800 acres within the mill town, including its primary structures.

- The Kennecott area will receive "full protection" under the parks' Fire Management Plan (FMP), meaning that unwanted wildland fires will be controlled through immediate and aggressive action.

- A campground may be developed along the McCarthy Road west of the Kennicott River if a need is demonstrated.

- Wayside exhibits describing area history and resources will be placed at scenic viewpoints along the Chitina-McCarthy Road.

- The state of Alaska's draft Southern Interior Region Transportation Study recommended that the McCarthy Road be widened to provide a 28-foot wide gravel surface. NPS recommended that the state maintain the road in essentially its then-current condition with improvements for public safety as needed, a position is based on current needs, public comments received on the draft plan, and anticipated visitation levels over the next several years.

### 1.5.2 McCarthy Road Scenic Corridor Plan (1997)

The Scenic Corridor Plan (SCP), released in November 1997, was jointly prepared by NPS, the Alaska Department of Natural Resources (DNR) and the Alaska Department of Transportation and Public Facilities (NPS et al., 1997; Gibert, 2001). It incorporated the State of Alaska's plans for a major upgrade to the McCarthy Road. The SCP proposed road design criteria consistent with NPS's 1984 Park Road Standards and ADOT&PF Standards; it also called for opening of scenic overlooks, construction of pullouts and interpretive waysides, trail development (including a bike-path), and development of a campground at the end of the McCarthy Road (NPS, 1999). The SCP also called for a design speed of 37 miles per hour and provided guidance on the minimizing the aesthetic impact of cut and fill operations.

The SCP proposes the following waysides in the McCarthy area:

1. McCarthy Overlook, a Type I Wayside at MP 56.9 with interpretive panels and parking for 4-5 vehicles. Its purpose would be to provide views of the McCarthy area.
2. National Park Service Campground, a Type III Wayside at MP 57.9 with toilets, a picnic area, camping, and parking for 20-50 vehicles. Its purpose would be to provide camping near the end of the McCarthy Road and Kennicott River.
3. Kennicott River Wayside, a Type III Wayside at MP 58.6 with toilets and parking for approximately 400 vehicles. Its purpose would be to provide basic parking, access, interpretation, and public services at the end of the road.

The SCP also made recommendations for gateway communities such as McCarthy. In addition, it proposed trails, including one that would parallel the entire McCarthy Road and extend into McCarthy, connecting there with other potential trails.

The State's plan for a road upgrade is part of an Environmental Impact Statement (EIS) that was released for public review and comment in 1997. Alternatives in the EIS ranged from no-action to paving.

### 1.5.3 Kennecott Interim Management Plan Draft Environmental Assessment (2000)

This EA analyzed four alternatives for the interim management of the Kennecott NHL:

1. *Preservation and Enhancement (Preferred Alternative)* provides for both short-term and long-term NPS actions focused on compatible design, incremental change, and the reestablishment of the historic character of the site.

2. *No Action* would continue the present management philosophy of maintaining structures and landscape features in their current condition, with the exception of measures taken in the event that threats of structural failure, loss of significant resources or safety risks are presented.

3. *Site Stabilization and Interpretation* would set into motion a program of stabilization for structures and landscape features, allowing for some minor expansion interpretation and more limited visitor access.

4. *Site Restoration and Enhancement* would have the historic site managed cooperatively by NPS and private operators, with a number of buildings being adaptively reused and others stabilized.

The EA concluded that the preferred alternative generated no significant adverse impacts on natural and cultural resources. At the same time, this alternative would provide a number of benefits, such as enhanced protection of archeological resources and historic structures, a better understanding of the history and significance of the site as well as improved safety for an increasing number of visitors. Of the three other alternatives, only the No Action alternative was

predicted to result in a number of negative impacts. Among these were the deterioration of historic buildings, lack of appropriate visitor education and interpretation leading to diminished visitor knowledge, and greater threats to visitor safety (NPS, 2000a). The final plan incorporated parts of Alternative 4 into the Preferred Alternative (#2).

### 1.5.4 Cultural Landscape Report – Kennecott Mill Town (2001)

The Cultural Landscape Report (CLR) outlined the treatment, management philosophy, management zones, and treatment recommendations that would guide management of the Kennecott NHL (Gilbert et al., 2001). This document also includes a detailed chronological site history accompanied by maps showing the evolution of the mill town over the past century, from its mining and milling heyday, through its abandonment, to its current "rebirth" as a national historic landmark and tourist attraction.

The Interim Operations Plan, which is Appendix A of the CLR, provided for both short-term and long-term NPS actions focused on compatible design, incremental change, and the reestablishment of the historic character of the site. Under this plan, NPS would begin to rehabilitate the company store for a visitor contact station, offices, and storage. Interpretive programs would be offered by NPS, concessioners, and other cooperators. Exhibits would be developed in coordination with the McCarthy Museum. Structures would be stabilized on a priority basis. A number of buildings would be opened for visitors to tour independently. Historical pathways would be reestablished and some vegetation clearing would take place. NPS would work cooperatively with the community to address the rehabilitation of the community building and fire and EMS response.

The Interim Operations Plan identified the primary NPS management goal as enhancing visitor understanding of Kennecott by preserving, protecting and interpreting key remaining structures and landscape features, patterns and relationships that define the historic, cultural and natural character of the NHL. Within the NHL, it designated six land use zones:

1. *Administrative Core*, including the office, manager's residence, depot, hospital, and staff housing. Appropriate uses for Zone 1 are NPS operations, offices, interpretation and a visitor center.

2. *Industrial Core*, including the concentration mill, tram deck, power plant, leaching and flotation plant, machine shop, tailings, flume structures, and warehouses. Appropriate uses of Zone 2 are interpretation, storage, equipment repair, workshop, and utility infrastructure.

3. *Residential "A"*, including Silk Stocking Row, old lodge, barracks, and local access roads. Appropriate uses are interpretation, residential, lodging, and tent cabins.

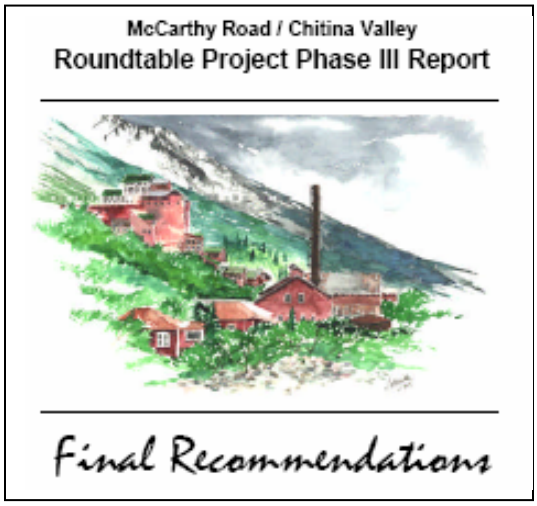
4. *Residential "B"*, including north end cottages. Appropriate uses are private residences and interpretation.

5. *Residential "C"*, including vegetated and cleared hillsides and historic dumps. Appropriate uses are residential, undeveloped, and natural resource protection.

6. *Commercial*, including the store, post office, storage, resident services, meat house, community facilities, housing and tent cabins. Appropriate uses are concession/ commercial (outfitters, bike rentals, guided tours, guest services, gift shop, bookstore), offices and community center.

### 1.5.5 McCarthy Road/Chitina Valley Roundtable Project Phase III Report (2002)

The three-phase Roundtable Project was begun in 1999 by the Copper River/Wrangell's Tourism Work Group of the Alaska Land Managers Forum in response to the Alaska Department of Transportation and Pubic Facilities (ADOT&PF) proposal to upgrade the McCarthy Road between Chitina and McCarthy (LDN, 2002). The Roundtable Project forecasted potential for growth and traffic volumes along the road, documented land use and development issues, and crafted specific options and management tools for addressing change and growth in the community. The project included substantial public input and participation by residents from Chitina, McCarthy, and along the road. The McCarthy Road Coordinating Group, brought together through this project, included stakeholders such as Ahtna Inc., Chitina Native Corporation, Chitina Traditional Indian Village Council, ADOT&PF, NPS, University of Alaska and the Alaska Department of Natural Resources (DNR). For the Kennicott River Segment (MP 56-60), the Phase III Report identified the following issues:




1. Uncoordinated development makes arrival at the end of the road confusing and not entirely welcoming to visitors.
2. Appropriate recognition of this area as the "reception" area to the park and the community of McCarthy/Kennicott.
3. Opportunities for private development.
4. Need to coordinate pedestrian, bicycle, automobile, and off-road vehicle circulation for safety and to improve visitors' experience along this busy stretch.
5. Vehicular access across the Kennicott River.
6. Provision of public infrastructure/utilities.

Six desired future conditions were listed:

1. "No Glitter Gulch", e.g., a desire for aesthetic development along the end of the road that enhances visitors' experience of the Wrangell-St. Elias National Park and Preserve and the presentation of McCarthy as a community.
2. Coordination of public projects within the corridor.
3. Ability to meet parking needs while not detracting from the spectacular setting.
4. Appropriate roles between private and public sectors.
5. Development of appropriate "tourism/visitor" facilities.

6. Resolution of "access" issues.

Implementation Actions included the following:

1. Development of "West-Side" Business Owners organization to coordinate development west of the Kennicott River.
2. Development of arrival sequence facilities as outlined in Roundtable meetings June, 2001.
3. Cooperative agreement for coordinated public/private provision of visitor facilities on west side.
4. Cooperation for development of "Gateway" prior to entering community. Provision of public facilities and orientation at NPS McCarthy Road Information Station.

The expectation of the Roundtable was that its recommendations could be jointly implemented by stakeholders "without imposition of additional governmental influence."

### 1.5.6 McCarthy Walk-In Campground Environmental Assessment (2002)

NPS prepared this EA on the proposed McCarthy Walk-In Campground for primitive tent camping near the McCarthy Airport, approximately one mile from McCarthy itself (NPS, 2002). The site would occupy 42 acres in a glacial fluvial outwash and access would be limited to non-motorized methods along a designated trail traversing federal land.


**Figure 1-4. Bear-proof food storage lockers at McCarthy Walk-In Campground**

This EA examined two alternatives: Alternative 1 – No Action and Alternative 2 – Develop Walk-in Campground near McCarthy Airport. Under Alternative 1, NPS would not develop a walk-in campground east of the Kennicott River and private-owned campgrounds west of the river would continue to provide camping opportunities for the public.

Alternative 2 was the Agency Preferred Alternative and also determined to be the Environmentally Preferred Alternative. Alternative 2 would include vault toilets, bear-resistant trash receptacles, water, and a centralized food preparation area. A well would be developed for drinking water supply. Campground site development would require limited surface disturbance and leveling for tent pads. A campground host would collect camping fees estimated at $5 to $10 per night per campsite) and oversee day-to-day operations. Alternative 2 incorporated a number of mitigation measures aimed at minimizing human-bear conflicts and other adverse effects.

### 1.5.7 Environmental Assessment: Interim Park Operations Support Complex, Kennecott District (2003)

In this EA, WRST analyzed the potential environmental impacts of a proposed temporary park operations support complex located at approximately mile 60 along the McCarthy Road, west of the Kennicott River (NPS, 2003a). This field season support camp would be for NPS employees temporarily stationed for up to five months at the Kennecott Mines NHL and employees of NPS contractors. Proposed development within the 4-acre complex would include portable housing structures, material staging and storage yard, and utilities including drinking water, septic, and telecommunications. Specific components of the project included:

- 1000 linear feet new gravel road, 20 feet each side of the centerline (0.9 acre)
- Fenced material storage yard (one acre)
- Well site, water line, and water storage tank (0.2 acre)
- Sewage, leach field, and septic tank (0.9 acre)
- Recreational vehicle (RV) parking pad (3 spaces, total 0.6 acre)
- Cabins, twelve units, each 192 square -feet living space
- Shower, kitchen, laundry support building (two units, each 800 SF)
- Building pads for cabins and support buildings (0.14 acre)
- Generator, generator enclosure and 500-gallon capacity fuel tank (0.02 acre)
- Satellite communications station (0.002 acre or 100 square feet)

The purpose of the support complex is to facilitate the emerging demands of managing the Kennecott NHL, with associated program demands for park interpretation, cultural resources management, resource protection, visitor protection, and law enforcement. NHL Management was and is guided by the Kennecott Interim Operations Plan (IOP), issued by the NPS in 2000 and summarized in Section 1.5.5 above on the CLR, to which the IOP was an appendix.

In comparing the Proposed Action with the No Action alternative, WRST found that the proposed support complex would offer benefits in the areas of park administration and visitor use. The Proposed Action would cause no adverse impacts on cultural resources and negligible adverse impacts on wildlife and land cover; it would also generate no significant restriction of subsistence uses. Thus, the Proposed Action (Alternative 2 – development of the Interim Park Operations Support Complex) was determined to be the Environmentally Preferred Alternative. By 2004, construction of the Interim Operations Support Complex was well underway (Figure 1.5).

**Figure 1-5. Temporary employee housing under construction in support complex (Sept. 2004)**

### 1.5.8 Kennecott Utilities Study, An Assessment of National Park Service Utility Needs at the Kennecott National Historic Landmark (2003)

This study assessed utility needs at the Kennecott NHL for the six months of the year it would be in operation (April 15th to October 15th) by investigating electrical power generation, utilidor configurations, heating, fire protection, potable water, and sewage disposal alternatives (ECI Hyer et al., 2003). Among the study's conclusions and recommendations were the following:

- Electrical Power – A combination of hydroelectric power generation and diesel generation would accommodate the NHL's needs; having both hydroelectric and diesel generation available would provided redundancy to the system during times of low stream flow, during start-up and shutdown, and during maintenance on the hydroelectric facility. The use of more efficient light fixtures should also be pursued to reduce load requirements.

- Utilidors (utility corridors or conduits) – Currently, wooden plank utilidors house the steam supply, condensate steam, and water for the structures; the utilidors are in poor condition, with many beyond repair. In some cases wooden utilidors were suggested to preserve the historic system, while in other instances buried utilities were suggested for protection of the utilities and reduction of installation and maintenance costs.

- Heating – Most buildings would not be heated during the six month operational season, but the store and west bunkhouse in particular would have the most significant heating systems, since they will provide residences and the greatest tourist interaction. Each building's heating needs are different and would be met individually by a variety of heating systems, such as fuel oil fired stoves, propane fired forced air furnaces, and oil fired boiler systems.

- Fire Protection – The current water service is incapable of providing enough water for fire suppression, so that another source is necessary. Bonanza Creek is recommended for this purpose; water supplied from this source could be used to supply water for the hydroelectric facility, fire suppression system, and potable water. The distribution system would consist of underground piping with installed hydrants, a sprinkler system at 12 structures, and a mini-pumper truck.

- Sanitary Sewer System – The five buildings that need sewer service are the same selected for water service. While conventional septic systems are typically ideal for remote locations and minimal use facilities, at Kennecott the steep terrain and small lot sizes complicate this option. Therefore, other options like alternative toilets and package treatment plants may be preferable for certain buildings depending on use rates and site characteristics.

### 1.5.9 Environmental Impact Statement: McCarthy Road, Alaska (initiated 2003; ongoing)

On November 5, 2003, the Federal Highway Administration (FHWA) published a Notice of Intent (NOI) in the *Federal Register* that, in cooperation with ADOT&PF, it would be preparing an EIS

and Section 4(f) evaluation for a proposed transportation improvement project on the McCarthy Road (FHWA, 2003). These improvements ran all the way from Chitina to the west bank of the Kennicott River, a distance of 60 miles.

Alternatives under consideration for this analysis include but are not limited to:

- No build; continued use of the current road, with limited on-going maintenance activities.
- Improving the most serious roadway deficiencies.
- Reconstructing the road to a design speed of 35 mph, considering all or some of the guidelines specified in the ``McCarthy Scenic Corridor Plan."
- Reconstructing the road to a design speed of 50 mph, meeting modern highway standards.
- Hybrid of the previous two alternatives: reconstructing some segments of the road with design speeds of 50 mph and others with 35 mph.

Under each alternative, minor realignments, the location and number of waysides and other enhancement facilities, and the final surfacing of the road (gravel or hard) are being evaluated.

### 1.5.10 Housing Management Plan (2004)

WRST's Housing Management Plan, updated every two years, noted that in 2002, six non-local permanent employees were stationed in McCarthy/Kennecott for the season. Housing was obtained through rental of private cottages and cabins, and the purchase of one cabin. However, the lack of sanitary facilities and electricity made this housing substandard. Non-local employees needed to meet operational requirements could not be housed. The deficit of non-shared units was 14 and the deficit of shared units was two. The support complex discussed in Section 1.5.8 above aims to alleviate (but not entirely eliminate) the acute housing shortage for McCarthy-Kennecott NPS employees and contractors.

### 1.5.11 NHL Interpretive Plan (2005)

An interpretive plan related to transportation themes for the NHL is scheduled for completion in 2005. A visitor survey will be conducted initially to ascertain the current and desired visitor experience at Kennecott.

### 1.5.12 Conclusion

In summary, along the McCarthy Road and at the "gateway" to the NHL, numerous projects and plans have been completed or are being prepared to address various issues such as transportation and access, wayside exhibits, public camping, and temporary NPS operations and support facilities. These activities involve the NPS, ADOT&PF, and the local community. Some of these projects have proceeded while others have been postponed.

## 1.6 ISSUES AND IMPACT TOPICS

To focus the environmental assessment, the NPS selected specific issues for further analysis and eliminated others from evaluation. Subsequent discussions of the affected environment and environmental consequences related to each alternative focus on those issues retained for further analysis. A brief rationale for the selection of each issue is given below.

### 1.6.1 Issues Selected for Detailed Analysis

*Soils and Topography*: Several of the actions involve potential localized impacts on soils from erosion due to clearing and grading of land. Topography is an important consideration as well, especially within the NHL, which is located on a steep hillside and dictates configuration, size and location of facilities like parking lots, turnarounds, and laydown/staging areas and visitor facilities.

*Water Resources*: Both water quality and water quantity/flow patterns are key issues. Protecting local drinking water sources is a priority of McCarthy's; at the same time, seasonal discharge patterns and flooding, and timing of ice-up and breakup are important issues at the Kennicott River crossing and at National Creek within the NHL. In addition, groundwater resources need to be protected from pollution by proposed septic systems.

*Floodplains*: Like most unregulated rivers, the Kennicott floods regularly and many of the options for crossing the river involve addressing the potential for flood impacts on any crossing facilities.

*Vegetation*: Localized impacts on vegetation could result from the proposed action, both from clearing and from cumulative effects of increased visitation to Kennecott-McCarthy. The spread of invasive plants may be affected by the alternatives.

*Wildlife*: Clearing vegetation could potentially reduce or affect wildlife habitat. Further, with regard to cumulative impacts, increased visitation could lead to increased interaction with wildlife in the area, leading either to population increases or declines, depending on how adaptable the species in question is to human presence. Management actions associated with human-bear conflicts could increase direct and indirect injury and mortality for both black and brown bears.

*Cultural Resources*: The project area includes a National Historic Landmark (Kennecott Mines) and a number of other cultural and historic resources outside of the NHL boundary. Each of the sub-actions that comprise the proposed action could potentially have direct and indirect impacts on cultural resources, as well as contribute to cumulative impacts on the same.

*Visual Resources*: Aesthetic resources are an important aspect of the character of Kennecott and McCarthy, as well as Wrangell-St. Elias National Park and Preserve in general. Several of the sub-actions could conceivably generate localized impacts on visual quality as well as contribute to cumulative impacts on the same.

*Visitor Use and Experience:* The historic town of McCarthy is both a point of departure for wilderness explorers and "flightseers" as well as a destination with certain cultural-historic values. While Kennecott also serves as a gateway to the glacial high country, it is primarily a destination

with significant historic values, as reflected by its NHL designation. The alternatives would have a direct or indirect bearing on the quality of the experience visitors to the area will receive. Cumulatively, the proposed action may facilitate increased visitor use and experience in the coming decades, with both adverse and beneficial impacts on visitor experience.

*Transportation and Access*: Transportation is already a central issue for the entire McCarthy-Kennecott area, specifically how to address the bottleneck at the Kennicott River crossing and what access should be provided to the NHL itself. Transportation has an important bearing on the proposed action, which in turn will have an important impact on transportation.

*Utilities and Related Services*: Utilities such as water and electricity supply and distribution, and telecommunications are limited in the project area, as are related services like solid waste disposal, fire suppression, and emergency medical services. Several elements of the proposed action would directly affect these. Also, potential solutions to utility issues may have direct and indirect impacts on water and other resources.

*Socioeconomic Environment:* The SFP will affect visitation to the McCarthy-Kennecott area, which in turn will impact socioeconomics in the surrounding community.

### 1.6.2 Issues Dismissed from Detailed Analysis

NEPA regulations emphasize the importance of adjusting the scope of each EA to the particular interaction of the project and its setting, and focusing on the specific potential impacts of that project. There is no need, according to the regulations, to include information on resources that would not be affected by the project. As a result, different EAs will discuss somewhat different lists of resources. Brief rationales dismissing certain issues from further analysis are provided below:

*Air Quality:* None of the proposed sub-actions is likely to generate more than short-term and negligible fugitive dust and/or tailpipe emissions.

*Wilderness:* The proposed action would not take place within the Wrangell-St. Elias Wilderness.

*Wetlands*: Executive Order #11990 and NPS Director's Order #77-1 require the protection of wetlands, but none of the proposed sub-actions would be located on wetlands or affect them indirectly.

*Noise*: While some of the proposed sub-actions would generate noise during construction and operational phases, noise levels are not anticipated to represent a long-term nuisance to residents, visitors, and wildlife or to intrude substantially into the solitude and silence of the Wrangell-St. Elias Wilderness.

*Threatened and Endangered species of flora and fauna:* Grizzly (brown) bears, Peregrine Falcons, and grey wolves all frequent the area. While each of these has been listed by the U.S. Fish and Wildlife Service at one time and place or another, none is currently listed in Alaska. No other listed species are known to be present.

*Fisheries*: Although the turbid Kennicott River presumably contains some fish within the project area, none of the sub-actions have the potential for generating significant short-term or long-term impacts on fish habitat or populations.

*Environmental Justice*: Executive Order #12898 requires federal agencies to examine their policies and projects for disproportionate impacts on low-income and minority populations. The percentages of minority and low-income residents in the project area do not appear to vary notably from average levels in the state.

*Subsistence*: Section 810(a) of the Alaska National Interest Lands Conservation Act (ANILCA) requires the proposed action to be evaluated for potential impacts on subsistence resources and activities, that is, habitat losses and fish and wildlife populations, access by hunters and fishers, and competition among hunters and fishers for subsistence resources. This issue was dismissed from analysis because the proposed action, at most, would have negligible impacts on subsistence. The ANILCA section 810(a) summary evaluation and analysis is provided in Appendix A.

## 1.7 PERMITS AND APPROVALS NEEDED TO IMPLEMENT PROJECT

### 1.7.1 Storm Water Permits

The Alaska Department of Environmental Conservation (DEC) sets water quality standards for Alaska waters and regulates discharges into these waters (18 Alaska Administrative Code (AAC) 70). All discharges of storm water from construction projects disturbing five acres or more require a National Pollutant Discharge Elimination System (NPDES), Storm Water General Permit for Large and Small Construction Activities from the USEPA and must be reviewed by DEC to obtain Section 401 Certification under the CWA. A Notice of Intent (NOI) form must be submitted to USEPA prior to the start of construction activities. The NOI form requests general information about the operator in charge of day-to-day operations of the construction site, location of the site, name of receiving waters, estimated start date and completion date of the project, and other information.

A Storm Water Pollution Prevention Plan (SWPPP) must be prepared prior to submission of an NOI and must:

1. Identify all potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site;
2. Describe practices to be used to reduce pollutants in storm water discharges from the construction site; and
3. Assure compliance with the terms and conditions of the permit.

### 1.7.2 Drinking Water Regulations

The Alaska Department of Environmental Conservation (ADEC), Division of Environmental Health, Drinking Water Program requires Public Water Systems (PWS) be in compliance with State drinking water regulations (18 AAC 80), in accordance with the Federal Safe Drinking Water

Act and Amendments. The project proposes installation of a water well in the campground to supply drinking water to visitors. The water well would qualify as a Class A PWS, which must be actively supervised by operators who are appropriately certified in accordance with 18 AAC 74. Well protection, source water protection, and well decommissioning are specified under 18 AAC 80.015. A minimum separation distance of 200 feet is required between a vault toilet and water well to protect the drinking water source from pathogen contamination (18 AAC 80.020).

### 1.7.3 Septic System Permit

Expansions or modifications of existing septic systems or construction of new ones would require a permit from the ADEC.

### 1.7.4 Wetlands Permit

While impacts to wetlands are not anticipated, Waters of the United States could be impacted by work in Bonanza or National Creeks. Any construction projects involving permanent alterations to these creeks would require a General Permit (GP) from the Anchorage District of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clear Water Act (CWA). If the area of impact is less than half an acre, the project(s) might qualify for a Nationwide Permit; otherwise, Individual Permits would be necessary. In addition, Section 401 of the CWA requires State water quality certification or waiver of certification prior to issuance of a Section 404 permit.

### 1.7.5 Alaska Department of Transportation and Public Facilities (ADOT&PF) Permits

The ADOT&PF may require permits for any use or modifications of the McCarthy Road and/or its right-of-way (ROW). The NPS would acquire the necessary authorization from ADOT&PF for the project.

# 2.0 ALTERNATIVES

CEQ regulations for implementing NEPA require that Federal agencies explore and objectively evaluate all reasonable alternatives to the Preferred Alternative, and to briefly discuss the rationale for eliminating any alternatives that were not considered in detail. This chapter describes a range of reasonable alternatives, including the No Action Alternative, and the Proposed Action or Preferred Alternative, as well as those that were considered and eliminated from further analysis. Tables 2-1 and 2-2 at the end of the chapter compare the alternatives and their potential environmental impacts.

## 2.1 NO ACTION ALTERNATIVE

CEQ regulations (40 CFR 1502.14) require the assessment of the No Action alternative in NEPA documents. The No Action alternative provides a baseline against which to measure the impacts of the other proposed alternatives.

The No Action Alternative includes current facilities that would continue to exist as well as ongoing operations that would continue to be implemented. That is, it represents the current and ongoing situation and assumes that these existing conditions would continue indefinitely. The main features of the No Action Alternative are highlighted in Figures 2-2a and 2-2b.

### 2.1.1 NPS Housing

Existing NPS housing consists of four small cabanas at Kennecott, two cottages on Silk Stocking Row, of which only one is habitable at present (as funds allow it is being brought up to code and NPS standards), and one cabin in McCarthy. Six units (cottages) are being constructed in the Interim Park Operations Support Complex in West McCarthy.

**Figure 2-1. Cabanas within the NHL for temporary NPS employees**

However, the EA (Interim Park Operations Support Complex – Kennecott District) for the West Side addressed the construction of 12 cabins and two support buildings to meet the identified housing need. Due to funding constraints, only six cabins and one support building are under construction at this time. However, under the No Action Alternative, a total of twelve cabins and two support buildings would be provided to house up to 15 employees.

In addition, there are approximately six privately owned historic houses remaining in the NHL; if any of the owners offered to sell their house to the NPS, the NPS would consider purchasing and rehabilitating it to provide additional employee housing.

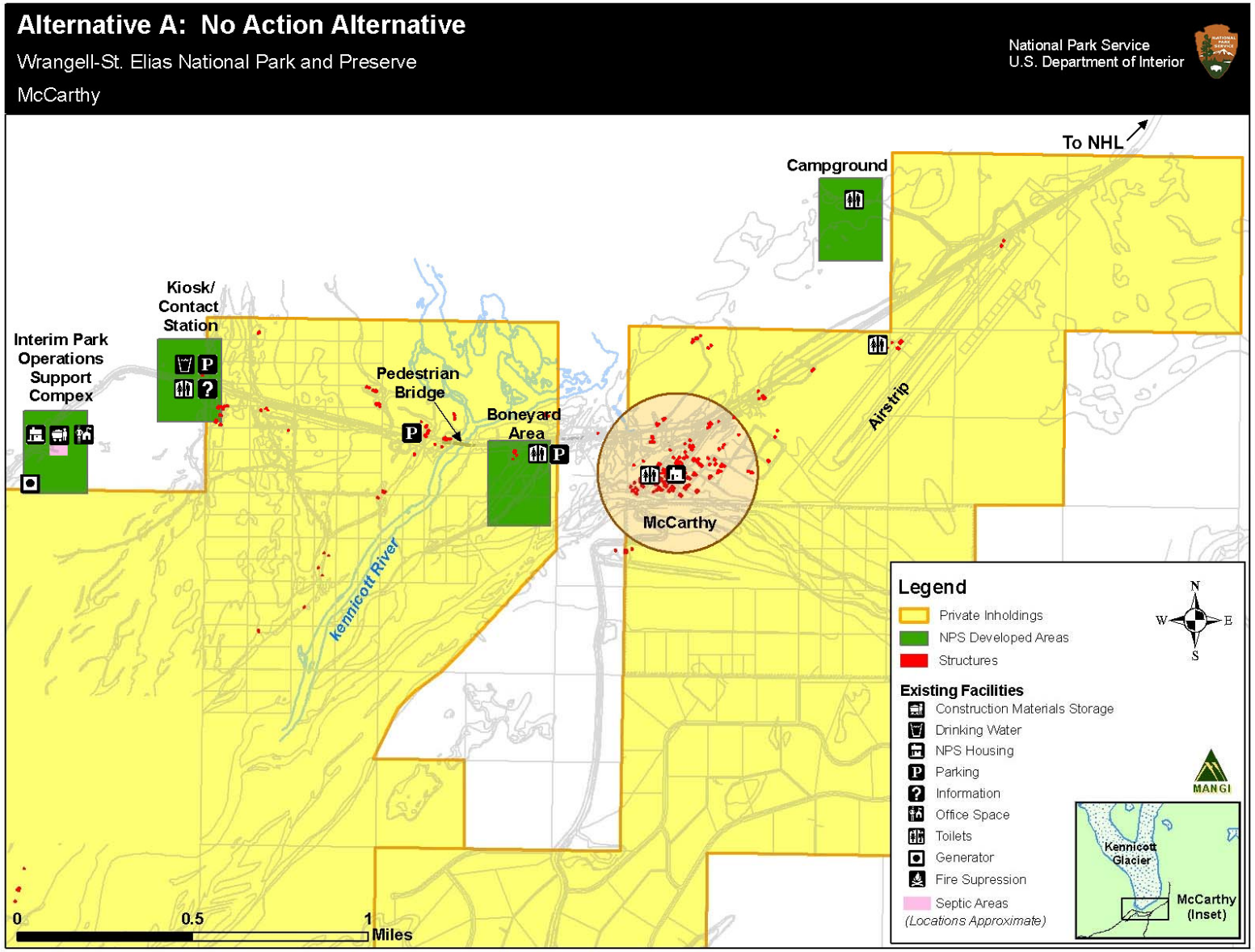



**Figure 2-2a. No Action Alternative for Kennecott Mines Support Facility Plan**

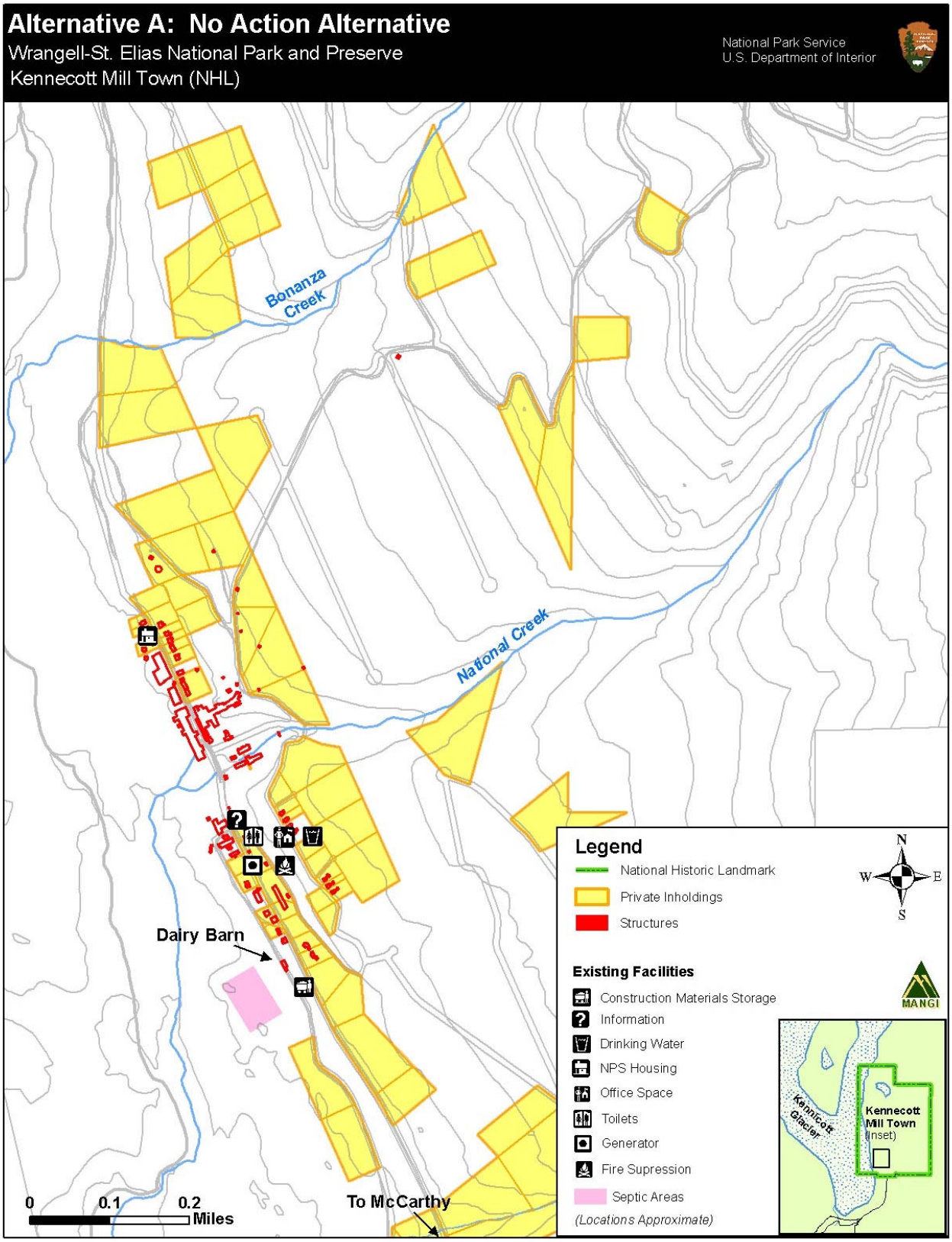



**Figure 2-2b. No Action Alternative for Kennecott Mines Support Facility Plan**

### 2.1.2 Construction Materials Storage

Within the NHL, the interiors of several historic buildings like the power plant and machine shop are currently used to store lumber and other buildings supplies. The existing storage and laydown site at the Dairy Barn, with a contemporary, bright blue tarp covering some supplies, would continue to be used.

Under the No Action Alternative, bulk storage would also take place at the newly constructed Interim Park Operations Support Complex site in West McCarthy west of the Kennicott River. This would serve both as a contractor storage camp and mobilization site in addition to providing NPS storage. Some bulk fuel storage would also occur at the support complex, but some bulk fuel storage would still be permitted in the NHL. Propane tanks used to service NPS buildings within the NHL would remain above ground.

### 2.1.3 Electrical Power

Under the No Action Alternative, NPS would continue to use a 20 KVA diesel generator and underground lines to bring power to the following buildings within the NHL: the Store, the contemporary Laundry, the New School, the Old School, the Recreation Hall, and, soon, the Dairy Barn. The generator is not sized for full build-out (i.e. it's too small) and does not fit within the historic context of the area. Propane would continue to be used for heat only, not for power; there would be no need for propane heat in winter, since there would be a full shut-down during cold weather, with limited exceptions.

On the west side of the Kennicott River, since propane would supply heat, a small (4 kw) generator would be sufficient to meet the electrical needs of the six cabin units, well, and support building. This generator can be increased in size if need is greater.

Under the No Action Alternative, emerging alternative energy sources like hydrogen fuel cells would be considered as they become feasible.

### 2.1.4 Wastewater Collection, Treatment and Disposal

The NPS-maintained sewer system in the NHL consists of two vault toilets and three septic systems; two of the septic systems are hooked up and in use. There is a septic/leach field between the new schools and the west bunkhouse. It serves the shower building and the new school restrooms. The septic systems currently in use at Silk Stocking NPS housing and the Dairy Barn

**Vault Toilets and Septic Systems**

Vault toilets and septic systems are two means of on-site wastewater collection and treatment.

A **vault toilet** is one in which fecal matter and urine are deposited without flushing into a permanently installed, watertight, below-ground container. The container is durable and corrosion-resistant and has a minimum capacity of 100 gallons; it also typically contains a caustic chemical and is vented to the outside. The tank should be emptied approximately every six months, at the beginning of each operational season, or when three-quarters full.

A **septic system** consists of two treatment elements: a septic tank (pretreatment) and the soil absorption system (drainfield or leach field). Gravity first carries the waste stream via a pipe into the two-compartment septic tank where separation occurs. Clarified effluent then passes from the tank to the leach field for final treatment and disposal.

were installed by the previous landowners. The Dairy Barn site also has a fairly well-developed leach field that could serve buildings south of National Creek. It consists of a 10,000-gallon septic tank on the property line of lots 2 and 3 and an ADEC-approved 936-square foot leach field on lot 2. However, this system is not hooked up and in use at present. Under the No Action Alternative, existing vault toilets and the two septic systems would be maintained and ADEC-compliant.

The west side development (Operations Support Complex) has a septic tank and leach field that support the size of the facility as it is now planned. The No Action Alternative would maintain these.

**Figure 2-3. Limited fire-fighting capability within the NHL exemplified by this foam fire extinguisher**

### 2.1.5 Fire Suppression

Very limited fire suppression capabilities now exist in the NHL, with foam being the only fire attack tool currently available. There is no water collection and storage system that is distributed to hydrants and sprinklers for fire protection. These conditions would continue under the No Action Alternative.

No initial attack capability exists for the McCarthy Road Information Station and other west side development (Support Complex). The NPS is currently constructing a sprinkler system for fire protection of the Support Complex and the No Action Alternative assumes this would be completed and functioning.

### 2.1.6 Drinking Water

Currently, the NPS provides bottled water for visitors to purchase in the NHL. There is also a seasonal, low-volume, ADEC-approved existing water system in the NHL – water is collected from National Creek and treated with chlorine to make it safe for drinking. Bottled water for purchase would continue to be the main source of drinking water in the future.

A production well exists at the west side development (Support Complex), but there is no general public drinking water source on NPS or private lands. This situation would continue in the future under the No Action Alternative.

### 2.1.7 Household Waste Management

The NPS currently manages its waste by using unsigned, bear-resistant trash containers at the McCarthy Road Information Station and in the NHL (one at each location). Trash is periodically

hauled along the McCarthy Road all the way to Glennallen for disposal there. These practices would all continue under the No Action Alternative.

### 2.1.8 Visitor Amenities

The McCarthy-Kennecott road would continue to be primarily for vehicles and the Wagon Road for pedestrians. The existing mix of bicycles, pedestrians, vehicles and all-terrain vehicles using the roads would continue.

At the NHL, the cut bank washout at National Creek has been fixed to provide a loop trail enabling the traverse of Silk Stocking Road and the top of the mill complex. Several existing foot trails – including Root, Bonanza, Jumbo and Erie – would continue in use, but the NPS would not clear brush or perform other maintenance on a regular basis. Under the No Action Alternative, these conditions would continue indefinitely.

Several public toilets are available in the McCarthy-Kennecott area: two at the McCarthy Road Information Station, two at the 2nd footbridge, one at the "Y" by the Museum, one at McCarthy Airport, one by the Company Store, two at the Recreation Hall, and one trail pit toilet at the Jumbo Creek camping area. The already planned restrooms in the Company Store would primarily serve NHL visitors during normal operating hours, and the three vault toilets in the Mill Town would then be for public use after normal operating hours. Facility development for the new campground includes vault toilets for campers.

**Figure 2-4. McCarthy Road Information Station in West McCarthy**

There would continue to be no welcome sign for visitors entering the McCarthy-Kennecott area. An existing Visitor Information Station (VIS), the McCarthy Road Information Station (Figure 2-4), with interpretive and informational media would continue to be located just west of the Kennicott River footbridge. The VIS is set back from the road; under current plans (and thus included in the No Action alternative) there would be an entrance sign to the area and VIS at Mile 59.5. The VIS is staffed from Memorial Day to Labor Day, seven days a week, eight hours per day and would remain so under the No Action Alternative. Maps and other information are available at the VIS. There is another small visitor center now serving the NHL at the Depot, and the Kennecott Company Store is being developed with the goal of it being a primary visitor information station.

### 2.1.9 National Creek Encroachment on Cultural Resources

As directed in the Interim Operations Plan, National Creek trestle rehabilitation would include clearing of debris out of an adjacent stream to help channelize the creek and prevent bank

erosion. Depending on the results and recommendations of an ongoing geomorphological study, NPS might also evaluate alternative methods to implement in National Creek to reduce erosion, flooding, and the damage they cause.

### 2.1.10 Transportation

NPS would continue to coordinate or cooperate with ADOT&PF and the community of McCarthy on the McCarthy Road SCP and EIS.

ADOT&PF and local businesses would continue to maintain the road within the state right-of-way from the NHL boundary to the west end of the study area, with no administrative structure or institutional arrangements to enable the NPS to participate in road maintenance.

West of the Kennicott River 8-10 parking spaces are available at the NPS McCarthy Road Information Station and three privately-owned parking lots. The parking spaces and private lots would continue under the No Action Alternative.

East of the Kennicott River, parking spaces were available until recently at the footbridge on the State right-of-way and private property. Earlier in 2005, this area was cleaned out and boulders placed by a private landowner so that parking is no longer available there. Vehicles and passengers may still load and unload. It is assumed that this situation would continue indefinitely.

Within the National Historic Landmark, motorists would continue to park vehicles along the rail corridor adjacent to the Kennicott Glacier Lodge and along the lower glacier road behind the Recreation Hall in an uncontrolled fashion. There would continue to be no designated turnaround area or visitor drop-off.

Other than walking and biking, privately operated van shuttles would continue to be the only method for visitors to get from the Kennicott River to McCarthy or the NHL. The available shuttles would not generally run early or late in the day, and may not be designed to accommodate wheelchairs or to transport bicycles. However, as at present, if specifically requested by customers, shuttles could make early or late runs.

The existing single-lane road between McCarthy and the NHL would continue to be used by automobiles, shuttle vans, all-terrain vehicles, motorcycles, bicycles, and pedestrians. The road would also continue to lack sufficient wide spots to allow other vehicles to pass.

## 2.2 PROPOSED ACTION ALTERNATIVE

This alternative consists of a number of features, elements, or sub-actions that comprise the Support Facility Plan and associated operations. In the following discussion, these features are organized by issues or themes. Figures 2-6a and 2-6b show the main features of the Proposed Action.

### 2.2.1 NPS Housing

The NPS would continue to identify and quantify current housing needs, and would make future adjustments in accordance with the NPS housing needs protocol. To respond to these housing needs, under this alternative, WRST proposes to construct more permanent housing units west of the Kennicott River, in addition to the six units presently being built at the Interim Park Operations Support Complex (described in Section 1.5.7). There are approximately six privately owned historic houses remaining in the NHL; if any of the owners offered to sell their house to the NPS, the NPS would consider purchasing and rehabilitating it to provide additional employee housing. NPS would seek rental of local privately-owned housing if needed.

This plan is addressing "more permanent housing units," meaning additional modern "Single Family Housing" (SFH) or "Dormitory" categories depending on future need. The estimated current need is to house 15 employees with an anticipated need in 2010 to house 31 employees. It is expected that the future need would include extended season use and potentially family requirements. Therefore, SFH and/or Dorm-style units are anticipated. The location for this additional development is generally south of the existing NPS Operations Support Complex, within the 700 feet of the well and on federal lands. Utilities would be provided by existing water, sewer and power (with necessary modification) currently on this site.

**Figure 2-5. Bulk storage area within the newly constructed NPS Support Complex in West McCarthy**

### 2.2.2 Construction Materials Storage

Under the Proposed Action Alternative, bulk storage would continue at the newly constructed Interim Park Operations Support Complex site in West McCarthy west of the Kennicott River. This would serve both as a contractor storage camp and mobilization site in addition to providing NPS storage. All bulk fuel storage would also occur at the support complex; *no* bulk fuel storage would be permitted in the NHL.

Within the NHL, limited project materials storage – in addition to equipment storage, equipment parking and employee parking – would continue to occur at the Dairy Barn; however, the following types of actions would be implemented to ensure storage is visually unobtrusive: fencing, vegetative management (e.g., allowing alders to grow and shield the view), and constructing sheds and other weatherproof

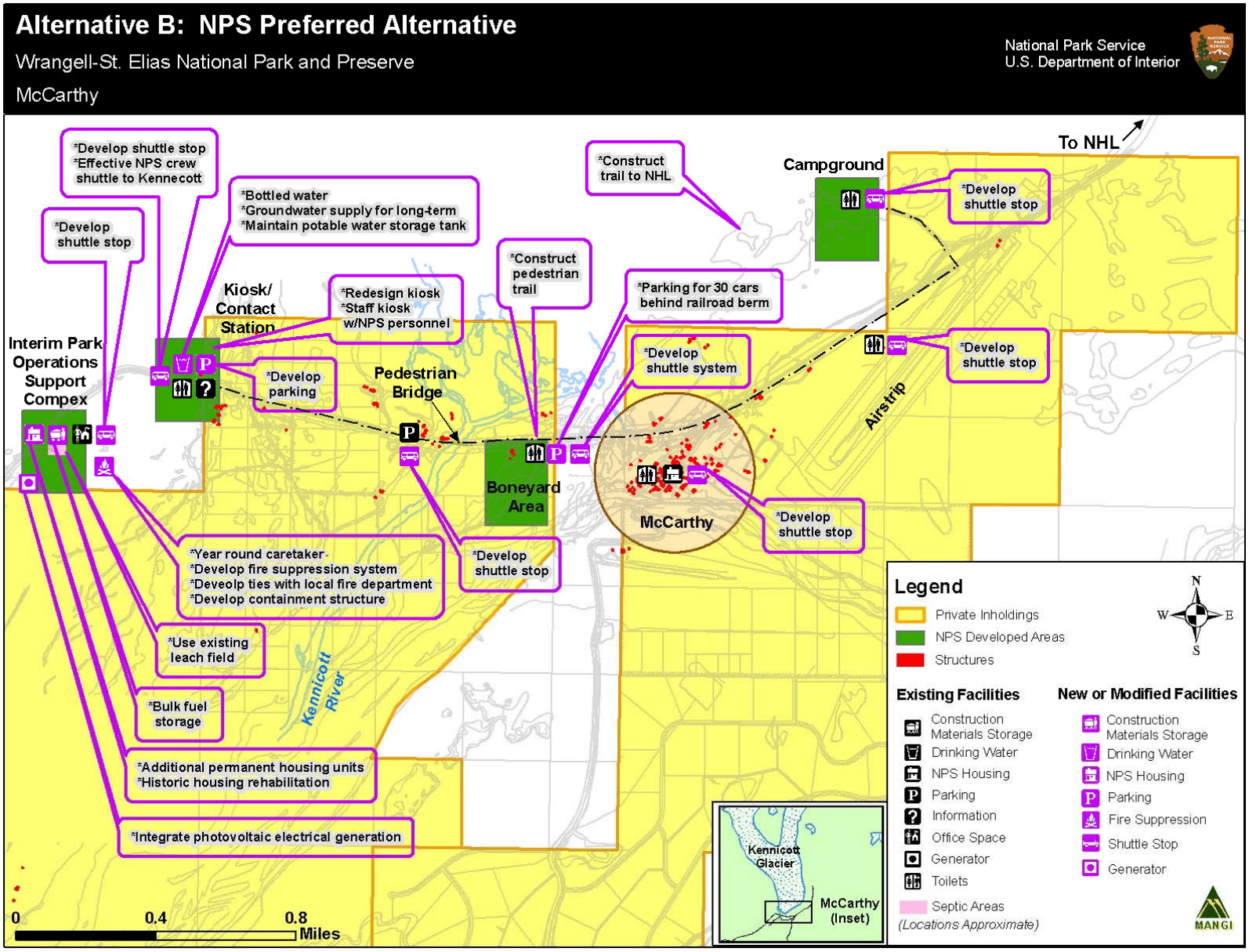



**Figure 2-6a. Main Features of Proposed Action**

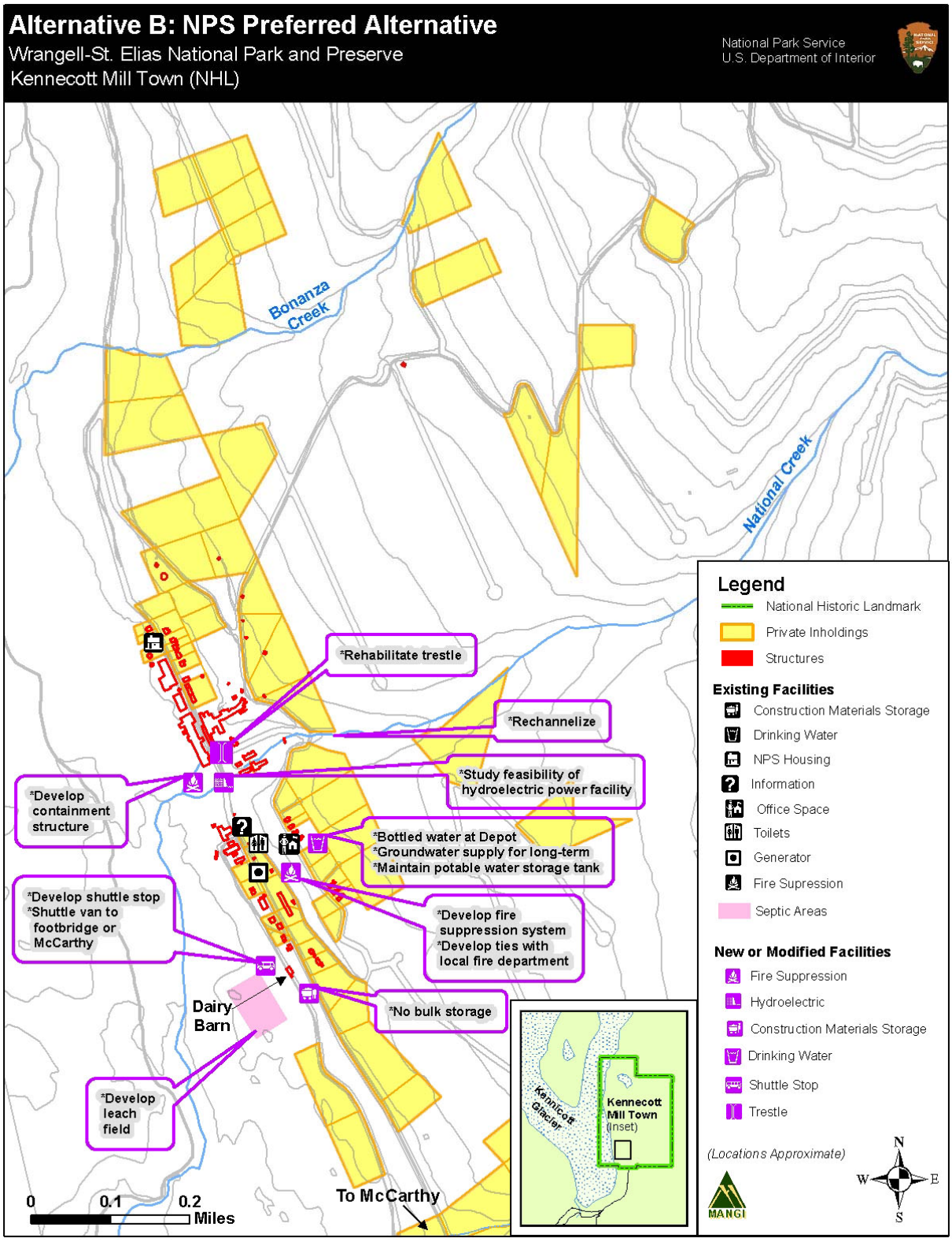



**Figure 2-6b. Main Features of Proposed Action**

structures that blend with the NHL's historic character. Assuming continued access via the freight bridge, the NPS would bury the propane tanks that service the NPS buildings in the NHL.

### 2.2.3 Electrical Power

Under the Proposed Action, NPS would approve the concept of a hydroelectric generation facility on Bonanza or National Creeks as the main source of electrical power within the NHL. A hydroelectric facility at either location would consist of several structures, including a diversion structure and intake site, a pipeline or penstock to transport water from the stream to the powerhouse, the powerhouse itself, containing a turbine and generator, a tailrace and flume to discharge water back into a watercourse (probably National Creek), and a transmission line that would carry power from the generator to the local grid. Most of these facilities would have to be constructed anew, though it may be possible to reuse the existing powerhouse. Either Bonanza Creek or National Creek could be routed to the powerhouse.

**Figure 2-7. National Creek within the NHL, just upstream of the Mill Town; gravity concentration mill in background**

The hydroelectric facility would not operate during the winter season while NHL operations are shut down. To protect the facility, certain shutdown and startup procedures would be needed, such as draining all water out of the penstock line to avoid freezing and rupture. Assuming the concept of a hydroelectric facility is approved, the NPS would need to conduct additional site-specific environmental documentation and public involvement prior to actual construction.

Only reconnaissance level engineering has been conducted; more detailed design engineering would still have to be carried out. But the fact that Bonanza Creek has already been used to generate hydroelectricity confirms the potential success of the project. Until such time as this project can be pursued and implemented, NPS would continue to use a 20 KVA diesel generator and underground lines to bring power to the certain buildings within the NHL. However, as noted under the No Action Alternative (Section 2.1.3), this generator is too small to meet anticipated future electrical demand and does not fit within the historic context of the area.

During stream low-flow periods, a supplemental power source would continue to be needed. Under this alternative, NPS would use its own generators when needed. Back-up power sources are propane or fuel oil #1.

On the west side of Kennicott River, there are two preferred power sources: propane and integrated photovoltaic electrical generation.

Over the longer term, in both the NHL and on the west side of the Kennicott River, NPS would consider emerging technologies such as hydrogen fuel cells.

### 2.2.4 Wastewater Collection, Treatment and Disposal

Collection, treatment and disposal of sewage (wastewater) generated by visitors and staff in NHL buildings and on the west side of the Kennicott River would be achieved primarily by septic systems (septic tanks and leach fields).

While the existing (currently unused) septic tank at the Dairy Barn is adequate, by 2015 NPS would expand the existing leach field by approximately five times to meet eventual full build-out and accommodate additional wastewater flows from the Old School, Recreation Hall, School, Machine Shop, West Bunkhouse and Store/Warehouse. The existing design allows for a total leach field area of 7,280 square feet on lot 2. Onsite sewage disposal would also occur for NPS buildings on Silk Stocking Row, which has an existing septic system. NPS would investigate if a second unit should be added, or whether a new system should be developed.

In McCarthy, NPS would develop a septic system, vault toilet, or burner for the McCarthy Cabin. No well would be developed; drinking water would be hauled.

In the Operations Support Complex on the west side of Kennicott River, the Proposed Action Alternative, like the No Action Alternative, would continue to use the newly installed, existing septic tank and leach field for long-term onsite disposal of sewage.

### 2.2.5 Fire Suppression

A year-round caretaker would be employed to provide site security within the NHL. NPS would develop a memorandum of understanding with the local McCarthy fire department that authorizes mutual aid agreement, training, provision of hydrants, fire response organization, and truck-mounted initial attack capability.

WRST would develop a fire suppression system in NHL that entails the following:

- A Community fire hydrant system running length of mill town
- A fire alarm/suppression system in NPS NHL buildings (pending a value analysis)
- Water catchment and containment for fire suppression upslope from Bonanza Road with seven thousand lineal feet of buried water line, and a 120,000 gallon water tank
- Capture of surface water from Bonanza Creek, at the same intake site as the hydroelectric intake, to provide water for fire suppression; if Bonanza Creek is not developed for hydropower, Bonanza Creek is recommended as a fire protection water supply source
- Development of a containment structure on National Creek near the old dam (a water holding tank for fire water supply)

At the Support Complex site west of the Kennicott River, WRST would develop a building sprinkler system with water plumbed from a well, as well as provide a plastic water holding tank external to the well house with up to 10,000-gallon tank capacity. Such a sprinkler system would also require a trench to each cabin from an existing water stub-out.

### 2.2.6 Drinking Water

In the short term within the NHL, NPS would make bottled water available for purchase at the Depot. Over the long term, groundwater supply is the preferred option within the NHL, with water available to the public at the Company Store. Up to two wells, depending on production capability, could be drilled within the NHL mill site and produce moderate amounts of water, approximately 1,000 gallons per day in total. Bonanza Creek and National Creek are backup options to groundwater supply. If a hydroelectric facility is eventually developed at Bonanza Creek, the same intake structure that would be used for hydroelectric generation could also be used to supply water for drinking (and fire protection). Both groundwater and surface supply would have to meet EPA and ADEC treatment standards for potable water, including filtration, disinfection, and regular monitoring to ensure that drinking water quality parameters are within acceptable limits.

For the site west of Kennicott River, NPS would maintain a potable water storage tank at the McCarthy Road Information Station with tank refills from the west side well in the Support Complex.

### 2.2.7 Household Waste Management

NPS facilities and local residents routinely discard household wastes that must be properly managed and disposed for sanitary reasons. Household wastes consist of garbage and trash derived from households including single residences, multiple residences, hotels, motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas. To facilitate sanitation and protection of the environment, NPS would consider revising the special regulations for WRST (36 CFR 1373) to allow consolidation of locally derived household waste at the Alaska Department of Natural Resources firewise pavilion site on McCarthy Road west of McCarthy. Subsequently, the consolidated household waste would be transported offsite to Glennallen for proper disposal.

### 2.2.8 Visitor Amenities

The Proposed Action Alternative would implement a number of actions, projects and operations to enhance visitor amenities and improve and expand upon the visitor experience in the McCarthy-Kennecott area. NPS would construct a trail to the National Historic Landmark from the footbridge by the lake at the toe of the glacier that follows east side of Kennicott River, paralleling the glacier, and connecting to Root Glacier trail. This would be constructed to pedestrian standards. A trail segment that links with the proposed walk-in campground would also be included.

The park would establish partnerships to maintain existing trails in the area such as Jumbo, Bonanza, and Root Glacier trails. Vault toilets would not be placed at trailheads in remote locations because servicing the toilets would be impractical; visitors would have to rely on established backcountry sanitation techniques. Primitive restroom facilities, such as outhouses, may be considered by NPS at a later date in locations to be determined.

NPS would also place a Welcome sign before the bend in the road on the west side of the Kennicott River (between MP58 and MP59). The sign text would identify the park unit, the NHL, and the community.

NPS personnel would staff the McCarthy Road Information Station assisted by trained community volunteers. As in the No Action Alternative, under the Proposed Action Alternative, the VIS would be staffed from Memorial Day to Labor Day, seven days a week, eight hours per day. Under the Proposed Action Alternative, NPS would explore partnerships for staffing.

The Park would partner with ADOT&PF, the McCarthy community, and/or ADNR to put panel information at the State's fire-wise pavilion west of the bend in the road. With this signage and visitor contact, WRST would introduce visitors to complex local land ownership patterns. The park also would develop and introduce a comprehensive sign and wayfinding system. A traveler information system providing timely information on park/NHL conditions, facilities, services and events could be developed at Long Lake for local AM-FM broadcasting.

### 2.2.9 National Creek Encroachment on Cultural Resources

Under the Proposed Action, as in the case of the No Action Alternative, needed steps must be taken to prevent further damage to the NHL's historic resources. National Creek trestle rehabilitation would include clearing of debris out of an adjacent stream to help channelize the creek and prevent bank erosion.

### 2.2.10 Transportation

Numerous steps would be implemented to address transportation issues under the Proposed Action Alternative. NPS would support a facility plan consistent with McCarthy Road Scenic Corridor Plan, including recommendations on proposed waysides in the McCarthy area (see Section 1.5.2), public and commercial improvements, and road design standards. The Wagon Road would be marked for visitor and local use; it would retain its historic character as a wagon road. WRST would provide transportation-related interpretive planning and exhibit development.

NPS would encourage ADOT&PF to design the rail corridor road as a one-lane gravel road that maintains its historic character with a 25-mph speed limit designed to accommodate safe vehicle passing. Between McCarthy and Kennecott, a cooperative agreement would be sought with NHL landowners and businesses to address NHL road maintenance and another cooperative agreement would be sought with the State and local landowners to address road maintenance outside of the NHL. The purpose of these cooperative agreements would be to find a method by which NPS can participate with other landowners on road maintenance activities.

West of the Kennicott River, this alternative would establish a gateway to McCarthy-Kennecott and expand NPS public parking (up to 50 day use spaces) in the vicinity of the existing McCarthy Road Information Station with an NPS welcome sign. Visitors would have the option to either take a shuttle van to the footbridge, park at privately owned lots, or they could simply walk to the footbridge and cross.

East of the Kennicott River, parking for loading and unloading adjacent to the footbridge would continue to be available on state ROW. Also on the east side of the river, the Proposed Action would encourage development of new private parking and develop parking for 30 cars on NPS land at the "boneyard" concealed behind the railroad berm.

Within the National Historic Landmark, NPS would develop a Memorandum of Understanding (MOU) with NHL landowners to manage vehicle access and parking. Vehicle parking in the NHL would be allowed by landowners, their guests, local McCarthy residents, NPS staff and contractors in designated, limited areas with a daily time limit. The Park Service would discourage the use of common easements in the NHL for vehicle parking. At the Dairy Barn, the only parking would be by NPS and contractors. Limited parking would be allowed by event organizers at the Recreation Hall when they are using that facility for a private function. NPS would pursue a policy with other NHL landowners of limiting parking to 2-4 hours within the ROW in support of transfer of goods and people. All parking would be south of National Creek.

The Proposed Action would organize an effective NPS crew shuttle system to service employees from the west side of the Kennicott River to Kennecott itself. WRST would work with local community to develop an efficient public shuttle system and adequate hours of operation. Designated van shuttle stops would be established at the west-side development (Support Complex), the McCarthy Road Information Station, the west and east sides of the footbridge, the boneyard, in McCarthy, at the 'Y' near the museum, the airport, the campground, and the NHL.

NPS would develop a vehicle turnaround in the NHL at the upper terrace of the recently-purchased Dairy Barn property near the southernmost boundary of the Mill Town. This site, which the previous owner created by fill, is adjacent to the road along the east boundary of lots 2 and 3; it appears to be large enough to accommodate a van turnaround. In addition, an area would be set aside for bicycle parking (perhaps under a covered pavilion) and an entrance sign.

**Figure 2-8. Proposed turnaround site in the NHL above roof of Dairy Barn below**

The NPS would authorize commercial operators to provide shuttle service from McCarthy to Kennecott. NPS would also encourage and support bicycle rentals and work with ADOT&PF to develop intervisible pullouts and other road design features to improve traffic flow and safety.

## 2.3 MITIGATION MEASURES

During any construction activities on any element of the Kennecott NHL Support Facility Plan, standard best management practices (BMPs) would be implemented. Implementation of these BMPS would control or reduce potential adverse impacts from soil erosion, surface water runoff, and sedimentation. In addition to these measures, other measures would be implemented to minimize or avoid adverse impacts on environmental resources as a result of implementation of either the No Action or Proposed Action Alternatives. Table 2-1 lists these other measures according to the resource area affected. The NPS would implement these measures as part of both the No Action Alternative and the Proposed Action Alternative, although more construction work would be conducted under the latter.

**Table 2-1. Mitigation Measures by Resource Area**

| Resource Area | Mitigation Measures |
|---|---|
| Soils & Water Resources | • The NPS would develop a Storm Water Pollution Prevention Plan (SWPPP) to control overland flow and reduce the potential for sedimentation from any construction site as required by the Alaska DEC NPDES Storm Water General Permit for Large and Small Construction Activities.<br>• Pursuant to Section 401 of the CWA, the NPS would obtain State water quality certification from Alaska DEC, when construction would occur in or near "Waters of the United States".<br>• Measures would be taken to prevent or control accidental spills of fuels, lubricants, and chemicals from entering waterways and wetlands. Specifically, no fuels would be stored at construction sites, refueling would occur away from waterways and wetlands, and an emergency spill kit, containing absorption pads, absorbent material, a shovel or rake, and other cleanup items, would be readily available on-site in the event of an accidental spill.<br>• Construction would not be conducted when soils are saturated, such as during or immediately following rain events.<br>• When a trail is constructed or maintained, ensure proper installation of drainage controls along the trail to control increased surface water runoff from the trail and to reduce subsequent erosion and sedimentation.<br>• All disturbed areas may be revegetated after construction to stabilize soils over the long-term. |
| Vegetation | • Project sites would be surveyed by a park botanist prior to ground disturbance – preferably during the design stage, when alternative locations may still be feasible – for the presence of rare plant species as designated by the Alaska Natural Heritage Program. Where practicable, all efforts will be taken to mitigate effects on rare plants by impact avoidance.<br>• Any disturbed areas would be revegetated using native materials removed from the project site for construction, or secondarily, with seed from local sources. Any storage of the vegetation mat would be limited to the minimum amount of time necessary to prevent loss of seed and root viability, loss of organic matter, and degradation of soil microbial activity. |

| Table 2-1. Mitigation Measures by Resource Area | |
|---|---|
| **Resource Area** | **Mitigation Measures** |
| Wildlife and Visitor Safety | • NPS will patrol the new walk-in campground regularly to ensure that campers are abiding by rules to follow the consistent securing of bear attractants, which would lower the potential for human-bear conflicts.<br>• NPS educational and outreach efforts to visitors and residents will consistently address the need to reduce conflicts with bears and means of doing so.<br>• Bear safety instructions would be posted at the campground kiosk.<br>• Use signage and/or brochures to remind visitors that as part of the national park system, wildlife is not to be disturbed. |
| Cultural Resources | • If previously unidentified archaeological features are encountered during construction inside or outside the NHL, work would cease immediately and the park superintendent would be notified to ensure protection of cultural resources. |

## 2.4 THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

As stated in Section 2.7 (D) of the NPS DO-12 Handbook, "The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in NEPA (Section 101(b))."

**National Environmental Policy Act (NEPA) Sec 101 Goal Statements**

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain wherever possible, an environment which supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(NEPA, 42 USC 4321-4347)

In sum, the environmentally-preferred alternative is the alternative that, not only results in the least damage to the biological and physical environment, but also that best protects, preserves, and enhances historic, cultural, and natural resources. The Preferred Alternative is clearly the environmentally preferred alternative because it attains the widest range of beneficial uses of the environment with minimal degradation, risk to health and safety, or other undesirable and unintended consequences; and assures for all visitors to the Kennecott-McCarthy area safe, healthful, productive, and esthetically and culturally pleasing surroundings. In particular, it provides for a higher level of cultural/historical resource preservation as well as a higher-quality

visitor experience, while at the same time accommodating the expected increase in visitation over the coming years.

## 2.5 ALTERNATIVES AND ACTIONS CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

The following alternatives or options were considered closely by the planning team but dismissed from more detailed analysis in the EA.

### 2.5.1 All NPS support facilities located within NHL

Under this alternative, all existing NPS support facilities would be relocated from McCarthy and West McCarthy up to the NHL itself, and all new facilities would be built there as well.

*This alternative was dismissed from more detailed analysis because it would lead to incompatible development within the NHL.*

### 2.5.2 Non-essential NPS support facilities located at new Operations Support Complex

This alternative is the opposite of the previous one. It would involve moving all non-essential NPS support facilities and activities – like bulk storage, office space, staff housing, etc. – out of the NHL itself and relocating them either in McCarthy or the Operations Support Complex west of the Kennicott River. Only essential visitor support infrastructure – water supply, sewage systems, fire-fighting equipment, etc. – would be maintained within the NHL District.

*This alternative was rejected from more detailed analysis in the EA because it is impractical, costly and unworkable, as well as unnecessary to protect the historic value and cultural integrity of the NHL.*

### 2.5.3 Cease all stabilization and preservation operations in the NHL

Under this alternative, NPS would remove all support facilities from the NHL and cease operations to stabilize and restore historic structures there. WRST would allow "nature to take its course" and permit but not encourage or facilitate visitation.

*This alternative was dismissed from more detailed analysis because this nationally significant historic/cultural resource would be subjected to "demolition by neglect" and NPS would be ignoring its mission and mandate to protect nationally significant historic resources under its ownership or jurisdiction. In addition, visitation would likely continue and increase for some years, in spite of the lack of support from NPS. Under this alternative, such increased visitation would not be provided for or managed; uncontrolled visitation would only accelerate the deterioration and loss of historic resources and artifacts.*

*This alternative would lead to an impairment of historical resources, specifically a National Historic Landmark, under WRST's jurisdiction. Under the NPS Organic Act and the General Authorities Act, impairment of park resources is prohibited.*

## Table 2-2. Comparison of Support Facility Plan Alternatives

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| NPS Housing | • Existing housing includes 4 small cabanas at Kennecott, 2 cottages on Silk Stocking Row (only 1 is habitable right now; as money allows it's being fixed up), & 1 cabin in McCarthy.<br>• Six units (cottages) to house seasonal employees are being built on the west side of River (west side development).<br>• Six additional units (cottages) cottages to house seasonal employees will be constructed on the west side of River (Park Operations Support Complex) as funding permits.<br>• Consider buying and rehabilitating any of 6 privately-owned historic houses in the NHL if they become available for purchase. | • Provide housing for 31 employees by 2010.<br>• Maintain all existing, under-construction, and planned housing in the NHL, McCarthy, and the Operations Support Complex.<br>• Construct more permanent housing units – including single family housing and dormitory style west of Kennicott River on federal lands south of the Park Operations Support Complex.<br>• Encourage employee rentals of local privately-owned housing<br>• Consider buying and rehabilitating any of 6 privately-owned historic houses in the NHL if they become available for purchase. |
| Construction Materials Storage | • Within NHL, the interiors of several historic buildings like the power plant and machine shop would continue to be used to store lumber and other buildings supplies.<br>• Within NHL, existing storage and laydown site at the Dairy Barn, with a bright blue tarp covering some supplies, would continue to be used.<br>• The new laydown area in west side development (support complex) would be used for bulk storage.<br>• Some bulk fuel storage would also occur at support complex.<br>• Propane tanks used to service NPS buildings within NHL would remain above ground. | • Bulk storage would occur at Operations Support Complex west of Kennicott River, as well as contractor storage camp and mobilization & NPS equipment storage.<br>• Limited project materials storage (in addition to equipment storage/parking & employee parking) would occur at Dairy Barn if it can be accomplished by a visually unobtrusive method such as fencing or vegetation.<br>• Bulk fuel would be stored at site west of Kennicott River (support complex).<br>• No bulk fuel would be stored at NHL.<br>• Assuming continued access via the freight bridge, the NPS would bury the propane tanks that service the NPS buildings in the NHL. |

## Table 2-2. Comparison of Support Facility Plan Alternatives

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Electrical Power | • Continue to use a 20 KVA diesel generator and underground lines to bring power to some buildings on the south side of National Creek within the NHL.<br>• Use propane for heat only, not for power. No need for propane heat in winter; expect full cold shut-down with limited exceptions.<br>• At Operation Support Complex, utilize a small generator sized to meet the need of 6 cabin units, well, and support building (though most is propane). Generator can be increased in size if need is greater.<br>• Consider emerging alternative energy sources like hydrogen fuel cells as they become feasible. | • To provide electricity within NHL, approve concept of hydroelectric power generation facility on Bonanza or National Creeks; present system would be used until this can be developed.<br>• During stream low-flow periods, a supplemental power source would continue to be needed.<br>• Utilize propane or fuel oil #1 as back-up power sources within NHL.<br>• At Operations Support Complex, preferred power source is propane with integrated photovoltaic electrical generation<br>• NPS would consider emerging technologies such as hydrogen fuel cells as they become available. |
| Wastewater Collection, Treatment and Disposal | • Continue using NPS-maintained sewer system consisting of vault toilets and one septic system in the NHL. Another existing but unused septic system at the Dairy Barn may also be brought into use.<br>• For Operations Support Complex on west side, continue to use existing on-site sewage disposal consisting of a septic tank and leach field. | • Collection, treatment and disposal of sewage (wastewater) in both NHL and the west side Operations Support Complex would be achieved primarily by septic systems (septic tanks and leach fields).<br>• Expand the existing leach field at the Dairy Barn to accommodate additional wastewater flows.<br>• Provide septic tank and 750 sq. ft. leach field for Silk Stocking Row houses.<br>• Develop well or septic system for McCarthy Cabin in McCarthy. |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Fire Suppression | • Very limited, existing fire suppression capabilities in the NHL would continue, with foam fire extinguishers the only fire attack tool available.<br>• No initial attack capability would exist for the McCarthy Road Information Station and other west side development (Support Complex).<br>• A sprinkler system would be installed for fire protection of the Support Complex. | • Use a year-round caretaker to provide site security.<br>• Develop memorandum of understanding with McCarthy fire department that authorizes mutual aid agreement, training, provision of hydrants, fire response organization, and truck-mounted initial attack capability.<br>• Develop fire suppression system in NHL that entails:<br>- Community fire hydrant system running length of mill town<br>- Install fire alarms/fire suppression sprinklers in historic structures<br>- Water catchment and containment for fire suppression upslope from Bonanza Road with seven thousand lineal feet of buried water line, and 120,000- gallon water tank<br>- Capture surface water from Bonanza Creek, at the same intake site as the hydroelectric intake, to provide water for fire suppression; if Bonanza Creek is not developed for hydropower, Bonanza Creek is recommended fire protection water supply source<br>- Develop containment structure on National Creek near old dam<br>• At Support Complex west of Kennicott River, develop building sprinkler system with water plumbed from well, and provide plastic water holding tank external to well house with up to 10,000-gallon tank capacity. |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Drinking Water | • NPS would continue to provide bottled water for visitors to purchase in the NHL.<br>• Low-volume, ADEC-approved existing water system in the NHL would continue to operate, using chlorine treatment to make it safe for drinking.<br>• At the west side development (Support Complex) a production well would supply water, but there is no general public drinking water source on NPS or private lands. | • In the short-term, have bottled water available for purchase at the Depot.<br>• Groundwater supply is preferred long-term option in NHL with water available to public at Company Store.<br>• Up to two wells, depending on production capability, could be drilled within the NHL mill site and produce moderate amounts of water, approximately 1,000 gallons per day in total.<br>• Bonanza Creek (surface water) is backup option to groundwater supply.<br>• At the Operations Support Complex west of Kennicott River, maintain a potable water storage tank at the McCarthy Road Information Station with tank refills.<br>• Support Complex supplied by well. |
| Household Waste Management | • NPS would continue to manage its waste by using unsigned, bear-resistant trash containers at the McCarthy Road Information Station and in the NHL (one at each location).<br>• Trash is periodically hauled along the McCarthy Road all the way to Glennallen for disposal there. | • Revise WRST regulations (36 CFR 1373).<br>• After revised WRST regulation is promulgated, consolidate locally derived household waste at Alaska DNR firewise pavilion site and contract for offsite transport and disposal in Glennallen. |
| Visitor Amenities | • The McCarthy-Kennecott road would continue to be primarily for vehicles and the Wagon Road for pedestrians.<br>• At the NHL, fix the cut bank washout at National Creek for a loop trail, which would enable the traverse of Silk Stocking Road and the top of the mill complex. | • Construct trail to national historic landmark from footbridge by lake at toe of glacier that follows east side of Kennicott River paralleling the glacier, and connects to Root Glacier trail. Also include a trail segment that links with the walk-in campground.<br>• Establish partnerships to maintain existing trails such as |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Visitor Amenities (continued) | • Several existing foot trails would continue in use, but the NPS would not clear brush or perform other maintenance on a regular basis.<br>• Several public toilets would continue to be available in the McCarthy-Kennecott area: two at the McCarthy Road Information Station, two at the 2nd footbridge, one at the "Y" by the Museum, one at McCarthy Airport, one by the Company Store, two at the Recreation Hall, and one trail pit toilet at the Jumbo Creek camping area.<br>• Already planned restrooms in the Company Store would primarily serve NHL visitors during normal operating hours, and three vault toilets in the Mill Town would then be for public use after normal operating hours.<br>• Facility development for the new campground includes vault toilets for campers.<br>• No welcome sign would greet visitors entering the area.<br>• The McCarthy Road Information Station would continue to be located just west of the Kennicott River footbridge, set back from the McCarthy Road.<br>• Under current plans there would be an entrance sign to the area and McCarthy Road Information Station at Mile 59.5.<br>• The McCarthy Road Information Station would continue to be staffed from Memorial Day to Labor Day, seven days a week, eight hours per day.<br>• Maps and other information would continue to be available at the McCarthy Road Information Station.<br>• A small visitor center now serving the NHL at the | Jumbo, Bonanza, Root Glacier, etc.<br>• Visitors would have to rely on established backcountry sanitation techniques. Primitive restroom facilities, such as outhouses, may be considered by NPS at a later date in locations to be determined.<br>• Clear vegetation on 0.24 acre to improve visibility of the McCarthy Road Information Station and redesign site to make it more inviting.<br>• Locate a visitor contact sign 50 feet from the McCarthy Road centerline and a flag pole between the visitor welcome sign and the McCarthy Road Information Station.<br>• Place a Welcome sign before the bend in the road on the west side of the Kennicott River (between MP58 and MP59). The sign text would identify the park unit, the NHL, and the community.<br>• Staff McCarthy Road Information Station with NPS personnel and trained community volunteers; staff it from Memorial Day to Labor Day, seven days a week, eight hours per day; explore partnerships for staffing.<br>• Partner with state and put panel information at state fire-wise pavilion west of bend in road.<br>• With signage and visitor contact, introduce visitors to area land ownership complexity<br>• Develop comprehensive signage and wayfinding system.<br>• Develop traveler information system at Long Lake for local AM-FM broadcasting. |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Visitor Amenities (continued) | Depot would continue to operate, and the Kennecott Company Store would continue being developed with the goal of it being a primary visitor destination. | |
| National Creek Encroachment on Cultural Resources | •Rehabilitate National Creek trestle by clearing of debris out of adjacent stream to help channelize creek and prevent bank erosion.<br>•Depending on the results and recommendations of an ongoing geomorphological study, NPS may evaluate alternative methods to implement in National Creek to reduce erosion, flooding, and associated damage. | •Rehabilitate National Creek trestle by clearing of debris out of adjacent stream to help channelize creek and prevent bank erosion.<br>•Depending on the results and recommendations of an ongoing geomorphological study, NPS may evaluate alternative methods to implement in National Creek to reduce erosion, flooding, and associated damage. |
| Transportation | •NPS would continue to coordinate or cooperate with ADOT&PF and the community of McCarthy on the McCarthy Road SCP.<br>•ADPT&PF and local businesses would continue to maintain the road within the state right-of-way from the NHL boundary to the west end of the study area, with no administrative structure or institutional arrangements to enable the NPS to participate in road maintenance.<br>• West of the Kennicott River 8-10 parking spaces would continue to be available at the NPS McCarthy Road Information Station, and privately-operated parking lots would remain.<br>• East of the Kennicott River at the footbridge, there would no longer be any parking, but loading and unloading of vehicles and passengers could still occur.<br>•Within the NHL, motorists would continue parking | • Support facility plan consistent with McCarthy Road scenic corridor plan.<br>• No wayside would be developed at the slide area.<br>• Mark Wagon Road for visitor/local use, and retain its historic character as a wagon road.<br>• Provide transportation-related interpretive planning and exhibit development.<br>• Design rail corridor road as one lane gravel road that maintains historic character with 25 MPH speed limit designed to accommodate safe vehicle passing.<br>• Seek cooperative agreement with NHL landowners and businesses to address NHL road maintenance.<br>• Seek cooperative agreement with State and local landowners to address road maintenance outside of NHL.<br>• West of Kennicott River: establish gateway to McCarthy/Kennecott and expand NPS public parking (up to 50 spaces) in vicinity of McCarthy Road Information |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Transportation (continued) | vehicles along the rail corridor adjacent to the Kennicott Glacier Lodge and along the lower glacier road behind the Recreation Hall in an uncontrolled manner.<br>• There would continue to be no designated turnaround area or visitor drop-off pick-up location.<br>• Privately operated van shuttles would continue to be the only method for visitors to get from the Kennicott River to McCarthy or the NHL. The available shuttles would generally not run early or late in the day (unless requested by customers), and may not be designed to accommodate wheelchairs or to transport bicycles.<br>• The existing single-lane road between McCarthy and the NHL would continue to be used by automobiles, shuttle vans, all-terrain vehicles, motorcycles, bicycles, and pedestrians. The road would also continue to and lack wide spots to allow other vehicles to pass. | Station with NPS welcome sign.<br>• Shuttle van options could be take shuttle to footbridge, or shuttle to McCarthy using the private freight bridge (visitors could choose between shuttle options, or simply walk to footbridge and cross).<br>• East of Kennicott River: parking would be available at footbridge on state ROW and private property. Encourage development of new private parking and develop parking for 30 cars at boneyard concealed behind railroad berm.<br>• In the NHL, develop MOU with landowners to manage vehicle access and parking; allow for vehicle parking in NHL by landowners, their guests, local McCarthy residents, NPS staff and contractors in designated, limited areas with a daily time limit.<br>• Discourage use of common easements in NHL for vehicle parking.<br>• Permit NPS and contractor parking only at Dairy Barn, and allow limited parking by event organizers at Recreation Hall when they are using the facility for a private function.<br>• NPS would pursue a policy with other NHL landowners limiting parking to 2-4 hours within ROW in support of transfer of goods and people.<br>• Organize effective NPS crew shuttle system to service employees from west side Kennicott River to Kennecott NHL.<br>• Work with local community to develop efficient shuttle system and adequate hours of operation.<br>• Establish designated van shuttle stops at the following locations: west-side development, McCarthy Road Information Station, west and east sides of the Kennicott R. foot-bridge, the boneyard, in McCarthy itself, at the 'Y' |

**Table 2-2. Comparison of Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Transportation (continued) | | near the museum, the airport, the campground, and the NHL.<br>• Develop a vehicle turnaround in the NHL at the upper terrace of the recently-purchased Gagnon property near the southernmost boundary of the Mill Town.<br>• NPS would institute Incidental Business Permit for public shuttles entering the NHL and seek to provide subsidies to support their operation.<br>• Encourage and support bicycle rentals.<br>• Work with ADOT&PF to develop intervisible pullouts and other road design features to improve traffic flow and safety. |

**Table 2-3. Summary Comparison of Impacts of the Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Soils and Topography | • Negligible, long-term, localized, adverse impacts to soils from continued soil compaction and erosion.<br>• Would likely contribute negligible, long-term, adverse cumulative impacts to soils.<br>• Cumulative impacts on soils from other actions would be moderate and localized. | • Minor, mostly short-term, localized, adverse impacts to soils from construction of new facilities.<br>• Would likely contribute minor, long-term, adverse cumulative impacts to soils.<br>• Cumulative impacts on soils from other actions would be moderate and localized. |
| Water Resources | • Negligible, long-term, localized, adverse impacts on water resources from continued stream sedimentation and possible water contamination.<br>• Would likely contribute negligible, long-term, adverse cumulative impacts to water resources.<br>• Cumulative impacts on water resources from other actions would be moderate and localized. | • Minor, long-term, localized, adverse impacts on water resources from stream sedimentation and possible water contamination.<br>• Would likely contribute minor, long-term, adverse cumulative impacts to water resources.<br>• Cumulative impacts on water resources from other actions would be moderate and localized. |
| Floodplains | • Negligible, long-term, localized, adverse impacts on floodplains from rechannelization of National Creek.<br>• Would likely contribute negligible, long-term, adverse cumulative impacts to floodplains.<br>• Cumulative impacts on floodplains from other actions would be moderate and localized. | • Minor, long-term, localized, adverse impacts on floodplains in general, but rechannelization of National Creek would represent a beneficial impact at that site.<br>• Would likely contribute minor, long-term, adverse cumulative impacts to floodplains.<br>• Cumulative impacts on floodplains from other actions would be moderate and localized. |

**Table 2-3. Summary Comparison of Impacts of the Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Vegetation | • Minor, long-term, localized, adverse impacts to vegetation from continued vegetation trampling and spread of exotic plants.<br>• Would likely contribute negligible, long-term, adverse cumulative impacts to vegetation.<br>• Overall cumulative impacts on vegetation from No Action and other actions would be moderate and localized. | • Minor, long-term, localized, adverse impacts to vegetation from vegetation clearing and trampling.<br>• Would likely contribute minor, long-term, adverse cumulative impacts to vegetation.<br>• Overall cumulative impacts on vegetation from Proposed Action plus other actions would be moderate and localized. |
| Wildlife | • Minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from continued human-bear conflicts.<br>• Would likely contribute negligible, long-term, adverse cumulative impacts on wildlife and wildlife habitat.<br>• Overall cumulative impacts on wildlife from No Action and other actions would be moderate and localized. | • Minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from disturbance of wildlife and loss of wildlife habitat with construction of new facilities and from possible continued human-bear conflicts.<br>• Would likely contribute minor long-term, adverse cumulative impacts on wildlife and wildlife habitat.<br>• Overall cumulative impacts on wildlife from Proposed Action and other actions would be moderate and localized. |
| Cultural Resources | • Moderately beneficial, long-term, localized, impacts on cultural resources.<br>• Would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources.<br>• Cumulative impacts from other actions would be moderate and long-term. | • Moderately beneficial, long-term, localized, impacts on cultural resources.<br>• Would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources. |

**Table 2-3. Summary Comparison of Impacts of the Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Visual Resources | • Moderately beneficial, long-term, localized, impacts on visual resources.<br>• Would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources.<br>• Certain existing development in and around the NHL would continue to have a moderately adverse, long-term impact on Kennecott's visual resources.<br>• The additional contribution of moderately beneficial, long-term impacts from NPS stabilization and rehabilitation of historic structures would produce a net minor, beneficial cumulative effect on the visual environment. | • Moderately beneficial, long-term, localized, impacts on visual resources.<br>• Would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources. |
| Visitor Use and Experience | •Minor adverse, long-term impact on visitor use and experience.<br>•Would interact with other ongoing and future actions to generate moderately adverse, long-term cumulative impacts. | • Moderately beneficial, long-term impact on visitor use and experience<br>• Would interact with other ongoing and future actions to generate moderately beneficial, long-term cumulative impacts. |
| Transportation and Access | •Long-term, moderately adverse impacts on transportation and access in the McCarthy-Kennecott area.<br>• Cumulative impacts from other actions | • Long-term, moderately beneficial impacts on transportation and access.<br>• Cumulative impacts from other actions by themselves would be moderately adverse |

**Table 2-3. Summary Comparison of Impacts of the Support Facility Plan Alternatives**

| Issue or topic | No Action Alternative | Proposed Action Alternative (NPS Preferred Alternative) |
|---|---|---|
| Transportation and Access (continued) | combined with the No Action Alternative would also be moderately adverse and long term. | and long term.<br>• Overall cumulative impacts, combining both the Proposed Action and other actions, would be beneficial, minor, and long term. |
| Utilities and Related Services | •Long-term, moderately adverse impacts on utilities and related services in the McCarthy-Kennecott area.<br>•Cumulative impacts from other actions combined with this alternative would also be moderately adverse and long term. | •Long-term, moderately beneficial impacts on utilities and related services.<br>•Cumulative impacts from other actions would be moderately adverse.<br>•Proposed Action and other actions would probably offset one another, resulting in negligible cumulative adverse impacts on utilities and related services over the long term. |
| Socioeconomic Environment | •Long-term, minor adverse impacts on the socioeconomic environment of the McCarthy-Kennecott area.<br>•Cumulative impacts from other actions would generally be moderately beneficial and long term.<br>•In combination with the other actions, the No Action Alternative would detract from anticipated cumulative socioeconomic benefits for the area because existing facilities and services would not be able to accommodate projected growth in visitation. | •Long-term, moderately beneficial impacts to the socioeconomic environment of the McCarthy-Kennecott area.<br>•The Proposed Action would contribute substantially to long-term, cumulative socioeconomic benefits for the surrounding area from other actions. |

# 3.0 AFFECTED ENVIRONMENT

Kennecott Mill Town, perched dramatically on a mountainside above the historic village of McCarthy and the gritty Kennicott Glacier, is a vivid reminder of the rich resources and ambition that drew adventurous souls to the "last frontier" of Alaska a century ago (Figure 3-1). Kennecott is tucked away in a remote corner of Wrangell-St. Elias National Park and Preserve, the largest unit of the entire national park system (Figures 1-1 and 1-2).

**Figure 3-1. Kennecott Mill Town perched above the Kennicott Glacier, covered by a layer of rubble/debris**

The Kennecott mines and mill operated from 1901 to 1938, when their exceptionally high-grade copper veins were depleted. Approximately $200 million in copper was extracted during this relatively brief period, profits from which were used to capitalize mining ventures in other regions of North and South America. Kennecott Copper Corporation is still an important company on international scene mining today (NPS, no date-a). The remaining structures at the mill site and mines symbolize an ambitious time of exploration, perseverance, and development in Alaska's extreme environment and remote setting. 14,231 acres of public and private land were designated a National Historic Landmark (NHL) District in 1986. In 1998, the National Park Service acquired 2,839 acres of land in the historic mill town, including its primary structures.

Listings in the National Register of Historic Places and National Historic Landmarks Program point out that Kennecott was one of the largest copper mines in the country and contained "the last of the great high-grade copper ore deposits of the American West" (NPS, 1978; NHLP, 2004). The mine and mill are representative of mining processes of their era. The camp or mill town still contains the powerhouse, tramway station, bunkhouses, and commissary, as well as the visually-dominant 14-story concentration mill. Kennecott was also the site of the world's first successful, commercial-scale ammonia-leaching plant in 1916. This pioneering process greatly increased the amount of recoverable copper ore.

Kennecott's mines constituted one of the richest copper deposits in the world (Bundtzen, 1982). At the peak of production in 1916, the mines were producing 175 tons of crude ore per day, averaging 70 percent copper. When Kennecott was abandoned in 1938, total production of copper was over 590,000 tons; in addition, about nine million ounces of silver were produced as a byproduct. This constituted almost 86 percent of Alaska's copper production and almost half its silver production (U.S. Bureau of Mines, 1975).

The National Historic Landmarks Program noted in 2004 that threats or damages to the Kennecott NHL include deterioration of structures and lack of maintenance in the six decades between the time the mine and mill closed in 1938 until they were purchased by NPS in 1998 (NHLP, 2004). The principal mill-related industrial structures, buildings at the mine entrances, and the mines themselves all went without maintenance for half a century. A number of structures have reached the critical point where preservation is no longer possible. Still other structures are in better condition but have suffered damage from previous attempts at salvage of building materials and thus made more vulnerable to deterioration from the area's harsh climate. Increasing visitation to the NHL raises the risk that one or more buildings will eventually be destroyed by fire or vandalism.

Kennecott NHL is the single most popular attraction among visitors to Wrangell-St. Elias. NPS needs a Support Facility Plan to guide development in the Kennecott-McCarthy area that responds to growing visitor demand and is at the same time sensitive to historic preservation, environmental and community concerns.

## 3.1 PROJECT AREA

The project area is located approximately 310 miles east of Anchorage, Alaska, near the eastern terminus of the 60-mile McCarthy Road (Figures 1-1 and 1-2). It extends in a corridor for several miles west along the McCarthy Road from the Kennicott River out to the DNR firewise pavilion and several miles northeast along the McCarthy-Kennecott extension of that road up to and including the Kennecott National Historic Landmark. Within this general corridor, there are several areas in which most actions associated with the Support Facility Plan are concentrated: the existing McCarthy Road Information Station, the existing Interim Operations Support Complex, both sides of the Kennicott River, the town of McCarthy, and the Kennecott NHL itself. Certain other actions in the SFP would be dispersed throughout the project area, particularly along the McCarthy-Kennicott Road itself.

## 3.2 SOILS AND TOPOGRAPHY

The project area occurs in the McCarthy Mountains subsection of the Wrangell Mountains ecoregion (NPS, 2001b). The valleys in the area are broad, U-shaped and composed mostly of glacial till, with some slope deposits on valley sides, and scoured bedrock. Valley soils are mostly well-drained, coarse and loamy with rocks, and exhibit little development beyond a surface organic layer. Wetter soils, probably with permafrost, occur in some depressions.

Mountains in the project area are rugged, though relatively low in elevation compared to the adjacent high mountains to the north. The mountains are composed of a variety of sedimentary rocks (limestone, sandstone, shale, and chert) and mafic igneous rocks (greenstone), and contain some areas of igneous intrusive rocks (mostly dacite and andesite). Mountain soils are mostly well-drained, rocky with a coarse-loamy matrix, and with little horizon development. Permafrost is probably present in many places, but where present it is generally below one meter in depth. Soils at lower elevation under dense vegetation have a surface organic horizon.

The floodplains are composed of sandy and gravelly alluvium. Soils are mostly stratified sand and gravel without permafrost or much horizon development beyond thin buried organic horizons. Later successional areas have a surface layer of silt and sand.

Kennicott and Root Glaciers are large valley glaciers that are outlets for icefields high in the Wrangell Mountains to the north. The glaciers are covered with snow, ice, and rock rubble and the lower part of the Kennicott Glacier is mostly debris-covered (NPS, 2001b).

**Figure 3-2. Kennicott Glacier covered with rock rubble and debris behind Kennecott power plant with stacks**

Topography in the NHL is steep, with slope angles ranging from $0^o$ (flat) to $25^o$, and many of the structures are located on the hillsides. The natural landscape at the Kennecott Mill Site placed restrictions on the spatial layout of mining infrastructure (Gilbert et al., 2001). Topographical constraints, such as the 4000-foot elevation change from the valley floor to the mine claims, affected placement of facilities, wagon routes, and transportation structures.

## 3.3 WATER RESOURCES

Two different types of rivers and streams flow in the McCarthy-Kennecott area. McCarthy Creek and the Kennicott River represent one type; they draw much of their water from melting glacier ice and carry a large load of silt and glacial rock flour as suspended sediment. McCarthy Creek is a third order tributary stream that flows into the Kennicott River in the vicinity of the community of McCarthy (NPS, 2004a). The Kennicott River is tributary to the Nizina River; the Nizina River is tributary to the Chitina River; the Chitina tributary to the first order Copper River that flows into the marine waters of Prince William Sound. The other stream type consists of the clear water streams originating from springs. Examples of these are Swift Creek, Clear Creek, National Creek, Amazon Creek, Bonanza Creek and Jumbo Creek. These latter streams run clear year around except during unusually heavy rains or the peak of spring snowmelt (McCarthy-Kennicott.com, 2005); turbidity and suspended sediments increase during extended or heavy rainfall, and during extended dry periods, surface flows diminish

**Figure 3-3. Chitina River downstream of Nizina River confluence**

considerably. Drainage off Bonanza Ridge flows in a westerly direction, either as subsurface outwash or along the margin of Kennicott Glacier (Gilbert et al., 2001).

**Figure 3-4. Kennicott River looking toward terminus of McCarthy Road and footbridge crossing**

Glacial waters seldom have substantial resident fish populations, but they do provide migration routes from the ocean to spawning and wintering grounds in clear water tributaries and lakes (NPS, 1986). Glacial streams have a higher gradient, higher sediment load, higher turbidity, and lower biotic productivity than non-glacial streams (NPS, 1990). The more productive clear water streams can support aquatic invertebrates and resident fish, and are of great importance for spawning.

The five-mile-long Kennicott River runs from the Kennicott Glacier down to the Nizina River. Two channels flow from the terminus of the glacier: the main channel is on the western side of an alluvial fan and the overflow channel is on the eastern side (Jones and Glass, 1993). Bluffs along the Kennicott River reflect down-cutting by stream erosion after the glacier melted back from its earlier, more extensive size. The river valley gets progressively deeper going downstream. The Kennicott River drops over 250 feet in its five-mile run between the glacier and the Nizina River. Where it empties into the Nizina, the Kennicott River is in an erosional canyon over 350 feet deep; ten miles further downstream the Nizina is entrenched over 600 feet where it joins the Chitina River (NPS, 2005a).

McCarthy Creek originates from glaciers along the south slope of the Wrangell Mountains and runs naturally turbid during the summer months. Its waters tend to clear during non-summer months (NPS, 2004a). Aquatic invertebrates and algae occur in McCarthy Creek. Large woody debris is present within the active channel. Suitable sized salmonid spawning gravels are also present within McCarthy Creek.

Fish habitat in McCarthy Creek contains many low-gradient riffles and scour pools as well as many high-gradient riffles (NPS, 2004a). Numerous off-channel habitats such as side channels and beaver ponds are present at low flows. Beaver ponds provide important rearing habitat for fish. High summer flows of McCarthy Creek may limit the success of spring spawning fish species by transporting stream channel substrate containing developing eggs. High levels of suspended sediments during summer flows may physically damage or cover developing eggs in relatively stable substrates. However, flows occurring in non-summer months are lower velocity, contain relatively little suspended sediment, and appear to provide an environment which supports spawning by fall spawning species such as Dolly Varden (NPS, 2004a).

Both glacial and clear-water streams have sudden and unpredictable rises in water level. The silt-laden waters of glacial streams are poorly suited for drinking, though they can be used in an emergency when collected in a container and given a chance for the coarser sediment to settle

out. Owing to local geology, the clear-water streams carry "hard" water with a substantial dissolved mineral content that precipitates readily as scale. Nearly all of the area clear-water streams cross private property and are regularly used by residents for domestic water supplies (McCarthy-Kennicott.com, 2005).

Concern whether geoenvironmental hazards related to the mines and mill exist at Kennecott was studied by Eppinger et al. (2000). The Kennecott mill complex lies at the base of Bonanza Peak (2,128 m), along the margin of the Kennicott Glacier, at about 610 m in elevation, whereas the mines that supplied the mill are located more than 1,500 m higher on the steep slopes of Bonanza Peak. Surface water samples from the Kennecott area had low metal concentrations. Although sediment, rock, and concentrate data indicated that high concentrations of potentially toxic elements such as arsenic, cadmium, copper, and mercury are found in mill and mine-waste piles, these metals are not mobilized because of the absence of acid-generating minerals in Kennecott-type deposits and the waste piles and mill tailings derived from them.

At Kennecott, surface waters are near neutral in pH and have relatively low conductivities (Eppinger et al., 2000). With respect to drinking water standards, none of the significant inorganic parameters listed by the Alaska Department of Environmental Conservation and U.S. Environmental Protection Agency (pH, Ag, Al, As, Ba, Be, Cd, $Cl^-$, Cr, Cu, $F^-$, Fe, Hg, Mn, Na, Ni, $NO_3^-$, Pb, Se, $SO_4^{2-}$, Tl, and Zn) exceed established maximum contaminant levels. The dominant sulfide minerals in the Kennecott deposits, chalcocite and djurleite, are relatively stable in the surficial environment. Although mercury was not analyzed in water at Kennecott, the likelihood of significant mercury present in the water column or of conversion to methylmercury is low, because the form of mercury (cinnabar) at Kennecott is highly stable, and the surface water is oxidized and has relatively high pH values.

The geochemical data from Eppinger et al. (2000) suggest that Kennecott-type deposits are relatively benign to the environment, due to the large amount of carbonate rocks present, the resulting high buffering capacity of waters, the absence of acid-generating minerals, and the scarcity of metals that could be mobilized at higher pH values.

## 3.4 FLOODPLAINS

Low-lying areas along McCarthy Creek and the Kennicott River have a history of flooding and flood damage (Jones and Glass, 1993). Snow and ice melt peaks in July and turns glacial streams into raging torrents. Floodplains along McCarthy Creek and its tributaries are frequently flooded and are prone to rapid erosion, scouring and deposition during intense rainfall and periods of rapid snowmelt. The 1980 flood event, one of the largest in recent history, covered or created nearly 850 acres of floodplain (NPS, 2004a). The peak discharge associated with this storm was $4500 ft^3/s$. Sediments from continual mass wasting accumulate in stream channels and are mobilized during floods. Severe lateral erosion, scour and deposition also occur during floods.

The Kennicott River is subject to one or more floods each year caused by outbursts from glacier-dammed lakes or from temporarily clogged subglacial channels (Jones and Glass, 1993). These releases of water inundate low-lying areas of the Kennicott River alluvial floodplain. Annual

outburst floods occur from glacier-dammed Hidden Creek Lake, which is located along the west margin of the Kennicott Glacier ten miles northwest of McCarthy (Rickman and Rosenkrans, 1997). Glaciers in the Wrangell Mountains commonly block ice-free tributary valleys, forming unstable lakes. Failures of the glacier ice dams cause periodic flooding downstream. Two glacier dammed lakes are found along Kennicott Glacier and four along Root Glacier. Hidden Creek Lake is the largest, and when it releases (usually in July or August), it causes intense flooding on the Kennicott River. This event can inundate the lower parking areas at the end of the McCarthy Road and cut off access to the footbridge.

McCarthy Creek, because it traverses the unstable landscape of a long valley downstream from its glacier, often carries a large load of non-glacial sediment. The head of McCarthy Creek valley is a convergence zone for precipitation that can generate destructive floods during periods of heavy rain (McCarthy-Kennicott.com, 2005). Low-lying areas along McCarthy Creek have a history of flooding and flood damage. Floods in the McCarthy Creek basin are commonly caused by not only intense and prolonged rainfall but may result from snow melt, formation and subsequent failure of landslide dams, snow avalanche dams, and sudden release of channel blockage by snow and ice (Jones and Glass, 1993).

Flooding is the largest cause of river channel instability, channel migration, and channel rerouting. It is the policy of NPS to preserve floodplain values and minimize hazardous conditions associated with flooding (Rickman and Rosenkrans, 1997).

Past mining and milling activities, road construction, and material stockpiling dating back to 1911 have adversely affected National Creek, particularly in the vicinity of the mill. The stream channel in National Creek's floodplain was confined, dammed, and diverted to support milling operations. These alterations caused hydrologic and hydraulic changes in the fluvial system and floodplain that remain evident today. Upstream of the mill, water diversion facilities were constructed in the National Creek floodplain. Remnants of these facilities remain onsite, causing blockage and restricting flow during floods. Dams, buildings, and mill tailings in the active floodplain are subjected to scour and sediment deposition. Channel obstructions consist of live trees, bedrock outcrops, buildings, equipment, and utility piping; around these obstructions are accumulations of naturally occurring woody debris and smaller pieces of mining-related debris—wood, piping, and equipment (NPS, 2003b).

An abundance of gravel-cobble sediment was deposited in the floodplain of National Creek and the lower levels of two buildings near the mill after an upstream dam failed and released a large amount of accumulated sediment (NPS, 2003b). The recent sediment deposits have created an unstable braided stream that is prone to bank erosion and rapid channel avulsions. Bedrock outcrops, mill debris, and small trees in the floodway control the stream location. The stream is attempting to incise through the recent sediment deposits.

## 3.5 VEGETATION

The project area occurs in the McCarthy Mountains subsection of the Wrangell Mountains ecoregion (NPS, 2001c). Vegetation in the valleys is mostly open white spruce (*Picea glauca*) or mixed spruce-birch forest. Some closed deciduous mid- to tall shrubs are present, especially

on valley side slopes. The mountains have little permanent ice and snow. High elevations have mostly exposed rock, talus, and scree with little vegetation. More stable lower slopes and valley bottoms have deciduous shrubs that generally increase in height and density downslope. Some white spruce forests occur at low elevations. Unvegetated or sparse shrubs and herbs occur in active floodplains. Less disturbed floodplains have deciduous shrubs or cottonwood (*Populus blasamifera*) trees, and later successional stages have white spruce forest.

Before the Kennecott Mill Site was developed in the early 1900's, repeated natural disturbances (e.g., advancing glaciers, floods, and fire) resulted in vegetation that was successional and supported four primary plant communities (Gilbert et al., 2001). These communities were:

**Figure 3-5. Balsam poplars wearing fall foliage**

- Seral herbs located along the moraine of Kennicott Glacier with scattered and newly established fireweed (*Epilobium angustifolium*), dryas (*Dryas drummondii*), soapberry (*Shepherdia canadensis*), and willow (*Salix* spp.) seedlings
- Open white spruce forest with cottonwood, paper birch, and an understory of willow and alder
- Closed white spruce forest on upper slopes, with paper birch as an associate and an understory of willow and alder (*Alnus crispa*)
- Open tall alder-willow shrub riparian zone along National Creek with barren areas from repeated flooding

Today a white spruce-hardwood forest with alder, willow, poplar, and mixed herbaceous plants dominates existing vegetation at the mill site (Gilbert et al., 2001). Virtually all of the land cleared during the mining era has revegetated. The lower elevations of Bonanza Ridge are forested. Further up the ridge, at tree line, the trees give way to shrubs and herbaceous vegetation. The ridge top is in the alpine zone. A spruce beetle outbreak that began in 1990 has killed many mature spruces. White spruce communities comprise 33% of the Kennecott Mill Site, shrub communities comprise 41%, and the remaining 26% cover is herbaceous (NPS, 2000a).

Vegetation surveys of the Kennecott District support operations project site (West Development Area) were conducted in July 2002 and June 2000 (NPS, 2003a). Based on field observations, the land cover types were balsam poplar woodland and open white spruce forest. Species present in the cottonwood woodland were cottonwood, feltleaf wouldow, diamond-leaf wouldow, soapberry, and dryas. Dandelion was the only non-native species present. Species occurring in the white spruce forest included white spruce, diamond-leaf wouldow, Bebb wouldow, grayleaf wouldow, soapberry, alpine bearberry, northern red- fruit toadflax, and dryas; major dominants were white spruce and soapberry. No federally or state listed plant species were found.

Vegetation communities along McCarthy Creek occur on the active floodplain, recently formed terraces, side slopes, and uplands (NPS, 2004a). The active floodplain is scoured by floodwaters every year or two, and is predominately barren gravels and cobbles with scattered forbs and willow shoots. Early successional terraces (5-15 years old) are sparsely vegetated with dryas mats, miscellaneous forbs and low willows. Terraces less than approximately 100 years old have early riparian forests of cottonwood and white spruce saplings, with an understory of willow, soapberry, and moss and forb ground cover. Older terraces support mature white spruce forests with scattered cottonwood trees, tall shrub understory (thickets of alder and willow) and ground cover with a rich vascular flora and thick moss layer. Steep side slopes rise above the terraced valley floor, forested with mature white spruce forest similar to the old terraces, or vigorous stands of young birch with an understory of shrubs such as highbush cranberry (*Viburnum edule*), soapberry and forbs including fireweed and lupine (*Lupinus arcticus*). Upland areas are gentle slopes with mature white spruce forest and patches of wetlands. The white spruce forests have been recently infested with spruce bark beetles, so that many of the older trees are dead, leaving spruce generally less than 100 years old, with scattered old birch and an understory of tall willow and alder. Wetlands have scattered black spruce (*Picea mariana*), low willows and ground layer of mosses and low ericaceous shrubs and forbs.

Higher elevations above tree line in the study area support sub-alpine and alpine plant communities. As the upper elevational limit of trees is approached, spruce forest becomes more open and there is a higher cover of tundra shrubs. In the southern Wrangell Mountains, shrub tundra and meadows within it contain a group of species generally absent in northern regions of the park. This trend is particularly evident in lush meadow areas where the vegetation is often dominated by species with coastal affinities such as *Arnica latifolia*, *Erigeron peregrinus*, *Carex nigricans*, *Heracleum lanatum*, *Juncus mertensianus*, *Luetkea pectinata*, *Senecio triangularis*, *Vahlodea atropurpurea*, and *Valeriana sitchensis* (NPS, 2005b).

Snowbed areas and north-facing slopes in the alpine zone are characterized by a high cover of heaths (principally *Cassiope tetragona*), mountain avens (*Dryas alaskensis*), polar willow (*Salix polaris*) and netted willow (*S. reticulata*) with a characteristic assemblage of common forbs including *Antennaria monocephala*, spring beauty (*Claytonia sarmentosa*), mountain sorrel (*Oxyria digyna*), *Polyganum viviparum*, and buttercups (*Ranunculus eschscholtzii*, *R. nivalis* and *R. pygmaeus*) (NPS, 2005b). Club moss (*Huperzia selago*) and the grasses *Hierochloe alpina* and *Trisetum spicatum* are also common in snowbed sites. A small group of species is noticeably more abundant in snowbed sites in the southern Wrangell Mountains as compared to northern regions of the park. *Luetkea pectinata*, *Potentilla diversifolia* and *Sibbaldia procumbens*, for example, are abundant in the south and west parts of the park and uncommon or absent in the north and east. Dry sites from the sub-alpine to alpine zone support a range of plant communities from discontinuous graminoid-forb associations to continuous dryas-graminoid-forb tundra depending on slope, aspect, substrate and slope morphology. Xeric alpine plant communities harbor numerous rare and endemic plant species. Endemic species that occur in dry sites throughout alpine areas of the park include *Astragalus nutzotinensis*, *Erigeron purpuratus*, *Saxifraga reflexa* and *Senecio ogoturukensis*.

Densmore and McKee (2001) found that the McCarthy-Kennecott area had the usual exotics of inhabited areas that have or have had gardens, lawns, and livestock including many common

dandelion (*Taraxacum officinale*) plants, many stands of several exotic clover (*Trifolium*spp.) species, quackgrass (*Elymus repens*), shepherd's purse (*Capsella bursa-pastoris*), pineapple weed (*Matricaria discoidea*), and a large seed bank of exotic agricultural weeds which would germinate if the soil were disturbed. The wagon trail and hiking trails had only a few dandelion. The worst area for potentially invasive exotic plants was around the building that was recently restored as the NPS visitor center for the mine. This area has been recently planted with smooth brome (*Bromus inermis*), red fescue (*Festuca rubra*), and other grasses, and oxeye daisy (*Leucanthemum vulgare*).

The NHL has not been surveyed for rare plants. However, rare plants were documented for Bonanza Peak along Bonanza Ridge (NPS, 2000). Six state listed rare plants have been documented for Bonanza Ridge (Table 3-1) and 41 rare plant species that are known to occur in the Chitina Valley (available in Gilbert et al., 2001) may also be found in the McCarthy-Kennecott area.

**Table 3-1. Rare plants documented for Bonanza Ridge**

| Common Name | Scientific Name | AKNHP Rank[1] |
|---|---|---|
| Aleutian cress | *Aphragmus eschscholzianus* | G3/S3 |
| Presl's sedge | *Carex preslii* | G4/S1 |
| Mountain fragile fern | *Cystopteris montana* | G5/S3 |
| Creeping savin | *Juniperus horizontalis* | G5/S1S2 |
| Mountain stitchwort | *Minuartia biflora* | G5/S2 |
| Pale poppy | *Papaver alboroseum* | G3/S3 |
| *Source: Gilbert et al., 2001* | | |

[1] AKNHP = Alaska Natural Heritage Program
G = global rank
S = state rank
G1 = critically imperiled globally (5 occurrences or fewer)
G2 = imperiled globally (6-20 occurrences)
G3 = either very rare and local throughout its range or found locally in a restricted range (21-100 occurrences), threatened throughout its range
G4 = widespread and apparently secure globally, although it may be rare in parts of its range
G5 = demonstrably secure globally, although it may be rare in parts of its range
S1 = critically imperiled in the state, 5 or fewer occurrences
S2 = imperiled in the state, 6-20 occurrences
S3 = rare or uncommon in the state, 21-100 occurrences

## 3.6 WILDLIFE

Wrangell-St. Elias National Park and Preserve contains one of the largest protected ecosystems in North America, and supports numerous populations of wildlife species. Wildlife management in the preserve is a cooperative effort among the National Park Service and the Alaska Department of Fish and Game (NPS, 2004a). The study area is situated in the preserve in Game Management Unit 11; notable wildlife species are brown (grizzly) bear, black bear, and moose, lynx, and red fox (NPS, 2000a). Caribou do not typically occur in the project area; the three caribou herds that use portions of the park and preserve are found north of the Wrangell Mountains (NPS, 2004a). Dall sheep are present at higher elevations, and are not typically found in areas where proposed actions would occur. Other wildlife species in the area include

snowshoe hare, red squirrel, porcupine, ermine (short-tailed weasel), northern red-backed vole, meadow vole, and, rarely, the little brown bat (NPS, 2000).

Two passerine migratory routes pass through the park and there are records for 239 species of birds with approximately 53 species listed as residents (NPS, 2005c). Common birds in the McCarthy-Kennecott area include the great horned owl, northern goshawk, spruce grouse, northern raven, black-billed magpie. Other passerine birds that can be seen in the area are the gray jay, dark-eyed junco, yellow-rumped warbler, orange-crowned warbler, black-capped chickadee, American robin, Swainson's thrush, ruby-crowned kinglet, alder flycatcher, and common redpoll (NPS, 2000). No waterfowl or shorebirds are known to inhabit the area.
A recent fish inventory (Markis et al., 2004) documented nine species of fish in the Chitina watershed, of which the McCarthy-Kennecott area is a part. The most abundant species included chinook (king) salmon, coho (silver) salmon, Dolly Varden, rainbow trout, and slimy sculpin. Less abundant species included arctic grayling, sockeye (red) salmon, longnose sucker, and round whitefish. No fish were found in National, Jumbo, or Bonanza creeks. Dolly Varden and coho salmon were found in Clear and Swift creeks. Dolly Varden also occurs in McCarthy Creek (NPS, 2003a). No survey data were presented for the Kennicott River.

**Figure 3-6. Alaskan Brown Bear**

Encounters between humans and bears (both black and brown) have been common in the McCarthy-Kennecott area for many years. In 2000 and 2001, the National Park Service conducted a bear study to quantify the nature of these encounters and describe the resident bear population (Wilder, 2003). A human-bear conflict is defined as any instance where human food, garbage, or other attractants bring bears into close proximity with humans; where bears opportunistically receive food rewards from human encounters; where property is damaged; where bears are killed or wounded; or any encounter where bears display aggressive behavior toward humans. Food and food odors are bear attractants; unsecured attractants can increase the number of human-bear conflicts.

Data indicate that at least 26, and possibly as many as 36, bears were killed during the years 1999 to 2001 (Wilder, 2003). In 2000-2001, there were 157 reports of bear-human conflicts, although this is likely an underestimate, as many incidents go unreported. The most common reason for conflicts was human food, and bears received a food reward in 37% of reported incidents. In the cases where the human party in the conflict was identified as either a local resident or park visitor, local residents were involved in 80% of reported human-bear conflicts. When conflict areas were mapped, most were centered on the end of the McCarthy road and the proposed campground. This location is a natural travel corridor, good berry habitat, and contains a high concentration of humans. A dangerous situation currently exists in the area due to the high number of food conditioned bears and lack of basic services for local residents.

Soapberry (*Shepherdia canadensis*) occurs on recent glacial moraines in very extensive stands. The fruit are relatively high in protein and energy and is easily digestible. In the fall bears seek

out the most productive and nutritious food sources available. The ripening of soapberry draws bears to the McCarthy-Kennecott area.

Based on the NPS bear study (Wilder, 2003), current knowledge and research regarding human-bear conflicts in the McCarthy-Kennecott area indicate that:

- The number of resident humans in the area, the number of humans visiting the area, the amount of road and trail access, the amount of off-road and off-trail travel, and the occurrence and sanitation of human development are positively correlated with the frequency of human-bear conflicts.
- Bears are common in the McCarthy-Kennecott area.
- Natural food sources for bears are abundant.
- Soapberries are an important food resource for bears in the area, and may influence the occurrence of human-bear conflicts.
- Past human-bear conflicts in the area have involved many bears rather than a few "problem" bears.
- High-quality food sources and increased human presence increase habituation of bears to humans.
- Unsecured attractants are a major cause of human-bear conflicts, and maintain the presence of food-conditioned bears.
- Bears habituated to humans and conditioned to human foods are responsible for the majority of recorded human injuries arising from human-bear conflicts.
- Defensive actions (shooting of bears) associated with human-bear conflicts would increase direct and indirect injury and mortality for black and brown (grizzly) bears.

## 3.7 CULTURAL RESOURCES

The historic significance of the Kennecott Mine and Mill Town are described in Section 1.2. Cultural resources include: historic properties as defined in the National Historic Preservation Act (NHPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA), archaeological resources as defined in the Archeological Resources Protection Act (ARPA), sacred sites as defined in Executive Order 13007, *Protection and Accommodation of Access To "Indian Sacred Sites,"* to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections.

As defined by the NHPA, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), including any artifacts, records, and remains that are related to and located in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the NRHP as a result of their association with the cultural practices or beliefs of an American Indian tribe

**Historic Property**: Sites, buildings, structures, or objects that may have significant archaeological and historic values, or properties that may play a significant traditional role in a community's historical-rooted beliefs, customs, and practices.

or Native Hawaiian organization. Archaeological resources include any materials of human life or activities that are at least 100 years old, and that are of archaeological interest.

**National Register of Historic Places (NRHP):** A nationwide listing of districts, sites, buildings, structures, and objects of national, state, or local significance in American history, architecture, or culture that is maintained by the Secretary of the Interior, NPS.

Section 106 of the NHPA (P.L. 89-655) provides the framework for Federal review and consideration of cultural resources during Federal project planning and execution. The implementing regulations for the Section 106 process (36 CFR Part 800) have been promulgated by the Advisory Council on Historic Preservation (ACHP). The Secretary of the Interior maintains the NRHP and sets forth significance criteria (36 CFR Part 60) for inclusion in the register. Cultural resources may be considered "historic properties" for the purpose of consideration by a Federal undertaking if they meet NRHP criteria. The implementing regulations at 36 CFR 800.16(v) define an undertaking as "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency." Historic properties are those that are formally placed in the NRHP by the Secretary of the Interior, and those that meet the criteria and are determined eligible for inclusion.

Those properties on the NRHP that possess exceptional value in illustrating the nation's heritage can be designated by the Secretary of the Interior as a National Historic Landmark. Only 3% of properties listed in the NRHP are designated as National Historic Landmarks. Section 800.10 of ACHP regulations (36 CRF 800), as well as Section 110(f) of the NHPA, offer protection from a Federal undertaking which may directly and adversely affect any National Historic Landmark. In addition, once a property is designated as a National Historic Landmark, the National Park Service commits to assist in the preservation of these irreplaceable properties through the National Historic Landmarks Assistance Initiative. The Assistance Initiative promotes the preservation of National Historic Landmarks through technical assistance to their stewards – owners, managers, and friends groups – and education of the general public about the importance of National Historic Landmarks. The National Park Service works with partners such as other federal agencies, state governments, Indian tribes, local governments, colleges and universities, private organizations and individuals, and nonprofit organizations such as the National Park Foundation, the National Parks and Conservation Association, and the National Trust for Historic Preservation to educate and assist the public in preserving its historic heritage (NPS, 2003c).

**National Historic Landmark (NHL):** A special type of historic property designated by the Secretary of the Interior because of its national importance in American history, architecture, archaeology, engineering, or culture.

In 1986, 14,231 acres of public and private land at Kennecott were designated a National Historic Landmark District. While NHL and National Register status are often a source of pride for landowners and the community, they grant no protection to the resources from the actions and development decisions of private landowners. Thus, the acquisition by NPS of 2,839 acres

in the historic mill town within the NHL in 1998, including most of the mill town's primary structures, was a major step forward on behalf of Kennecott's preservation.

As described in Section 1.2, the Kennecott NHL faces a number of challenges related to its long-term preservation. Many of the historic structures are in great need of stabilization to prevent their collapse or gradual deterioration and disintegration from decades of exposure to the harsh forces of nature in the area.


**Figure 3-7. Ma Johnson's Hotel in McCarthy**

The town of McCarthy developed in the early 1900's as a mining support town. Its location as a central freight and passenger stop ensured its growth as the Kennecott mine and mill grew; all rail traffic bound for Kennecott had to pass through McCarthy. When the mine and railroad eventually closed in the late 1930's, McCarthy lost most of its population, but it was never abandoned entirely; it never became a ghost town (McCarthy Lodge.com, 2005). Today, McCarthy contains a number of historic structures.

### 3.7.1 Cultural Landscapes

Cultural landscapes are broadly defined as geographic areas that include both natural and cultural resources, and the wildlife or domestic animals therein that are associated with a historical event, activity, or person, or that exhibit either cultural or aesthetic values.

At Kennecott, as in all mining ventures, the occurrence and utilization of natural resources as well as broader landforms and topography helped shape the development and operation of the mines and mill. From the early exploration and discovery of high-grade copper ore on Bonanza Ridge to the eventual siting of infrastructure, processing facilities and related services at the moraine on the edge of the Kennicott Glacier, the nature of the landscape heavily influenced the configuration and functional relationships of the mill town's components (NPS, 2000). Vegetation clearing, the location of the copper ore and mines above the mill site, the steep terrain, the presence of the Kennicott Glacier, and the presence of Bonanza and National creeks, exploited for hydroelectric power and water, respectively, all affected development of the Kennecott cultural landscape. This landscape was intensively inventoried by NPS in its 2001 *Cultural Landscape Report.*

Outside the NHL, the historic town of McCarthy, associated with Kennecott almost from the very beginning, would represent an undesignated cultural landscape. The existence and location of the town at the foot of the mountain, near the confluence of Kennicott River and McCarthy Creek, and its close proximity to the mill town are a function of both the natural landscape and historical social and economic factors. The road from McCarthy to Kennecott, following the old railroad bed, and the old wagon road between McCarthy-Kennecott would also have features of cultural landscapes.

### 3.7.2 Archeological Resources

Archeology is the study of physical evidence left behind by past generations, both prehistoric and historic, and later discovered on the ground, under the ground, and underwater.

At the time of first contact with Europeans, what is now Wrangell-St. Elias National Park was occupied primarily by Athapaskan Indians, in particular the Ahtna of the Copper River drainage. When the Athapaskan Indians arrived in the area is not well known, but they may have been present for more than a thousand years (NPS, 1986). Numerous sites representing the later Athabascan tradition, dating to about 800 BP, have been documented along the western boundary of the national park and preserve. Major excavations have been conducted at Dakah De'nin's Village, a site situated along the Copper River near Chitina, dated from the protohistoric period. Directly across the river, at Taral, investigations have revealed an historic period occupation (NPS, no date-b). To date, no significant prehistoric archeological resources have been identified in the Kennecott-McCarthy area.

Within the NHL, archeological features help define the character of Kennecott (NPS, 2000a). Archeological resources in the NHL include collapsed buildings, pipelines, large industrial artifacts (e.g. mining equipment, remnant cable, machinery), dumps, and equipment storage piles. Most of these are considered significant because of their association with historic activities at Kennecott during 1900-1938. Other later features that are not considered significant are not managed as cultural resources. Approximately 70% of the mill town's surviving archeological resources are considered to be in stable condition, that is, having reached an equilibrium with the processes of deterioration and erosion. Stable resources would include large metal objects; wooden features like collapsed buildings tend not to be in stable condition.

Outside the NHL, an archeological survey along the McCarthy Road conducted by the Alaska Office of History and Archeology identified significant and insignificant historic resources, most associated with the Copper River and Northwestern Railway, including trestles, railway remains, remnants of old homesteads and artifact scatters (NPS, 2002). Archeological-cultural surveys by WRST staff at the McCarthy walk-in campground and the Interim Operations Support Complex did not identify any significant resources at either site (NPS, 2003a).

### 3.7.3 Historic Structures and Buildings

Within the NHL, historic structures include boardwalks, dams, bridges, tram towers, and landscape features such as tailings piles. Many of these structures are made of wood and are continually deteriorating (NPS, 2000a). A failed dam on National Creek caused flood damage to the National Creek bunkhouse, railroad trestle, and the assay building.

**Figure 3-8. Train turnaround (switching station) in McCarthy**

The NHL includes 45 major residential, commercial, and industrial historic buildings, 25

outbuildings, and the four upper mountain mine sites. Of 70 standing buildings, 14 major buildings have been acquired by NPS. All of them are built of wood and have survived more than 60 years of abandonment and neglect; their condition ranges from poor to fair (NPS, 2000a).

Outside the NHL, McCarthy contains a number of historic buildings and some historic structures like the switching station (Figure 3-8).

### 3.7.4 Cultural Objects, Museum Collections and Archives

Kennecott artifacts include cultural objects and archival materials. Cultural objects are items like tools, domestic items, remnants of larger features, wooden pipes, equipment, and machinery parts (NPS, 2000a). The objects, made of both metal and wood, are scattered throughout the landscape but may also be found in buildings, dumps, and equipment storage piles. The metallic objects are considered stable but the wooden objects continue to be subject to erosion and weathering-related deterioration.

Archival materials consist of forms, receipts, and other paper documents, usually found in buildings. These materials have been collected over the decades both by collectors and through combined efforts of the University of Alaska, NPS, and the McCarthy Museum. Uncollected archival materials remaining in the mill town tend to be in poor condition (NPS, 2000a).

## 3.8 VISUAL RESOURCES

Wrangell-St. Elias National Park and Preserve, as noted in Chapter 1, has some of the most spectacular scenery and visual resources anywhere in North America. While the Wrangell Mountains in the project vicinity are not as lofty as in other parts of the park, the McCarthy-Kennecott gateway community is still known for its outstanding views of rugged Alaskan wilderness, including glaciers, snow-capped mountains, rivers, and extensive boreal forests.

**Figure 3-9. Existing NPS bulk storage area in the Kennecott NHL**

Within the NHL itself, visual resources include a cultural-historic component, that is, the view of aging, individual, historic buildings and structures in various states of deterioration, and more holistically, the appearance of the historic mill town district in its entirety. In recent decades, unmanaged vegetation, especially trees and shrubs, have encroached upon and obstructed many historic views (Gilbert et al., 2001). Also, certain newer, non-historic structures and land uses within the NHL may not be entirely consistent with the desired appearance and character of the Kennecott Mill Town, or may impinge upon important viewsheds. An example is the existing NPS materials laydown/storage area near the Dairy Barn, in which supplies and tarp(s) covering them can be visually prominent or obtrusive (Figure 3-9).

## 3.9 VISITOR USE AND EXPERIENCE

The NPS Organic Act calls for the national park system and NPS, "to provide for the enjoyment of the [resources] in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS, 2001d). WRST has two mission goals that follow from this broad statutory mandate:

**Mission Goal IIa:** *Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.*

Enjoyment of national parks is a fundamental aspect of the visitor experience. Visitor enjoyment and safety are affected by the quality of park programs, facilities, and services, whether provided by the National Park Service, a concessioner, or a contractor. Availability of park facilities, services, and recreational opportunities refers to convenient locations and times of operation that fit visitors' transportation and schedule needs (NPS, 2000b).

**Mission Goal IIb:** *Park visitors and the general public understand and appreciate the preservation of parks and their resources for this and future generations.*

Visitors' park experiences grow from enjoying the park to understanding why it exists and the significance of its resources. Satisfactory visitor experiences build public support for preserving this country's heritage as contained in the national parks (NPS, 2000b).

Total visitation at WRST is on the rise. Recreation visits grew from 40,352 in FY 2002, to 43,311 in FY 2003, and 57,221 in FY 2004 (NPS, 2005d). The Kennecott District is the most heavily visited area of the park: recent visitation studies showed that more than 50% of park visitors go to McCarthy-Kennecott. Visiting McCarthy-Kennecott was the third most popular reason for visiting the park, and walking around the Kennecott mine site was the third most popular visitor activity. Furthermore, the most popular backcountry in WRST is the backcountry surrounding the McCarthy-Kennecott area. Most park visitation takes place between June and September, and visitors come to the Kennecott District by road or air as shown below (NPS, 2003a):

**Table 3-2. Visitation to Kennecott District, 2000-2020**

| Year | Visitors Arriving by Road | Visitors Arriving by Air |
|---|---|---|
| 2000 | 8,012 | 470 |
| 2005 | 8,704 | 822 |
| 2010 | 9,527 | 1,174 |
| 2015 | 11,098 | 1,526 |
| 2020 | 11,864 | 1,878 |

*Source: State of Alaska, McCarthy Road, Chitina Roundtable Project, April 2000*

At present time, the area still offers limited facilities and services to accommodate the use and contribute to the enjoyment and education of Kennecott-McCarthy visitors. There is no welcome sign for visitors arriving at the McCarthy-Kennecott area, nor even any overall sense of have entered this historic district. While some visitor facilities are provided, information on services

and activities can be hard to find. Lack of readily available information about land ownership patterns can sometimes result in visitors accidentally trespassing on private lands. A McCarthy Road Information Station – the McCarthy Road Information Station – with interpretive/ informational media is located just west of the Kennicott River footbridge, but it is set back from the road where it is inconspicuous, and it does not have sufficient staffing (it is staffed by park employees from Memorial Day to Labor Day, seven days a week, eight hours per day). While maps and other information are available at the McCarthy Road Information Station, the facilities provide inadequate wayfinding.

As described later in the transportation section, reaching the NHL from the Kennicott River can prove time-consuming or inconvenient for visitors. In addition, confusing parking arrangements have occasionally resulted in conflicts between visitors and private property owners.

Within the NHL itself, there is presently a small visitor center at the Depot, and the Kennecott Company Store is being developed with the goal of it being a primary visitor destination. While the Mill Town retains much of its historic, rustic character and charm, ongoing stabilization and rehabilitation activities may interfere somewhat with visitor enjoyment of individual structures and buildings. Some of structures are off-limits to general visitors for safety reasons or are being used for storage. In addition, some non-historic, non-compatible more recent development detracts from the overall historic character of the site.

Existing plans have not yet been implemented for fixing the cut bank washout at National Creek for a loop trail, which would enable the traverse of Silk Stocking Road and the top of the mill complex. Several other existing trails are overgrown and in poor condition, compromising the visitor experience.

Several public toilets are available in the McCarthy-Kennecott area: two at the McCarthy Road Information Station, two at the second footbridge, one at the "Y" by the Museum, one at McCarthy Airport, one by the Company Store, two at the Recreation Hall, and one trail pit toilet at the Jumbo Creek camping area. Proposed restrooms in the Company Store will primarily serve NHL visitors during normal operating hours, and the three vault toilets in the Mill Town would then be for public use after normal operating hours. There are an inadequate number of toilets on the north side of the NHL, and there are no public toilets on the west side of the Kennicott River at the footbridge. Facility development for the new walk-in campground includes vault toilets for campers.

## 3.10 TRANSPORTATION AND ACCESS

The main transportation route in the area is the McCarthy Road, which reaches its eastern terminus on the west bank of the Kennicott River at about MP 60. Some park staff commute weekly from Richardson Highway communities to McCarthy along this route. There is no bridge providing access to vehicles across the river at this point, but a state-built footbridge allows pedestrians and carts to cross. The one-lane, unpaved McCarthy Road continues on the east side of the Kennicott River, skirting past McCarthy and continuing for about four miles up to the Kennecott Mill Town, following the original railroad alignment. This road is used by automobiles, shuttle vans, all-terrain vehicles, motorcycles, bicycles, and pedestrians. It

generally lacks wide spots to allow other vehicles to pass and on busier days this can lead to congestion.

ADOT&PF and local businesses maintain the road within the state right-of-way from the NHL boundary to the west end of the study area, but at present there is no administrative structure or institutional arrangements to enable the NPS to participate in road maintenance. Overall, the road between McCarthy and Kennecott is inadequately maintained and safety problems exist like the lack of intervisible pullouts to readily and safely allow vehicles moving in the opposite direction to pass.

An historic, unpaved wagon road provides an alternate route for hikers and pedestrians from McCarthy to Kennecott.

Approximately one-quarter mile downstream of the footbridge crossing of the Kennicott River is a vehicular bridge constructed on private land by a local resident with bridge-building experience. NPS utilized this bridge on several occasions, but crossing fees were high, and so NPS used it sparingly. WRST negotiated a permit with the owner that allows for unlimited freight crossings for a flat fee.

As mentioned in Section 2.1.10, NPS is cooperating with ADOT&PF and the community of McCarthy on implementing the McCarthy Road SCP. However, the McCarthy-Kennecott Mines NHL segment did not receive funding from the State of Alaska or the NPS, and is not part of the EIS for the Chitina-Kennicott River segment

West of the Kennicott River 8-10 parking spaces are available at the NPS McCarthy Road Information Station, and there several privately-owned parking lots, including one at the footbridge. The NPS parking at the McCarthy Road Information Station is inconvenient due to its distance from the Kennicott River footbridge, and there have been some conflicts with parking and loading/unloading at the footbridge. There is, however, a free shuttle between NPS parking at the information station and the Kennicott River footbridge.

East of the Kennicott River, informal, unmarked parking spaces for up to about 15 vehicles used to be available at the footbridge on the State right-of-way and private property; however, in 2005 this space was eliminated and now the site can only be used for loading and unloading supplies and passengers from vehicles.

Within the NHL, motorists now park vehicles along the rail corridor adjacent to the Kennicott Glacier Lodge and along the lower glacier road behind the Recreation Hall in an uncontrolled fashion. There is no designated turnaround area or visitor drop-off.

Besides walking and bicycling, several privately operated van shuttles are the only method for visitors to reach McCarthy or the NHL from the Kennicott River. These shuttles do not usually run early or late in the day, and are not generally able to readily accommodate wheelchairs or transport bicycles. If specifically requested by customers, shuttles can make early or late runs.

## 3.11 UTILITIES AND RELATED SERVICES

### 3.11.1 Energy and Electrical Power

Within the NHL, the NPS uses a 20 KVA diesel generator and underground lines to bring power to certain buildings on the south side of National Creek: Store, contemporary Laundry, New School, Old School, Recreation Hall, and, soon, the Dairy Barn. However, the generator is not large enough to supply projected power needs with full build-out; furthermore, it does not fit within the historic context of the area. Interior space heating needs in spring, summer and fall are met by propane; full shut-down during winter months precludes the need for heating during the coldest season.

On the west side of the Kennicott River, electrical power needs for both office space and housing in the Interim Operations Support Complex will be met by a small 4 kw generator.

### 3.11.2 Wastewater Collection, Treatment and Disposal

The NPS-maintained sewer system in the NHL includes vault toilets and two septic tanks. There is a septic tank/leach field on lot 33 along Silk Stocking Row which services the cottage on that lot. It was installed by a previous owner and its ADEC status (i.e. whether it is permitted and in compliance) is unknown. The Dairy Barn site also has a fairly well-developed leach field that connected to buildings south of National Creek. It consists of a 10,000-gallon septic tank on the property line of lots 2 and 3 and an ADEC-approved 936-square foot leach field on lot 2. However, this system is not and has never been used.

The west side development (Support Complex) has a septic tank and leach field that support the size of the facility as it is now planned.

### 3.11.3 Fire Suppression

The NHL has very limited fire suppression capabilities, with foam being the only fire attack tool currently available. There is no water collection and storage system that is distributed to hydrants and sprinklers for fire protection. These conditions would continue under the No Action Alternative.

On the west side of the Kennicott River, no initial attack capability exists for the McCarthy Road Information Station and the Interim Operations Support Complex. The NPS is currently constructing a sprinkler system for fire protection of the Support Complex.

### 3.11.4 Drinking Water

Currently, the NPS provides bottled water for visitors to purchase in the NHL. There is also a seasonal, low-volume, ADEC-approved existing water system in the NHL – water is collected from National Creek and treated with chlorine to make it safe for drinking. However, turbidity and a lack of power to drive the chlorination process make this system difficult to maintain.

Significant upgrades to the system would be required to expand capacity sufficiently to meet anticipated visitor demand in the future.

A production well exists at the Interim Operations Support Complex in West McCarthy, but there is no general public drinking water source on NPS or private lands there.

### 3.11.5 Household Waste Management

The NPS currently manages its household waste by using unsigned, bear-resistant trash containers at the McCarthy Road Information Station and in the NHL (one at each location). Trash is periodically hauled along the McCarthy Road all the way to Glennallen for disposal there.

## 3.12 SOCIOECONOMIC ENVIRONMENT

McCarthy is located in the Valdez-Cordova census area of Alaska, one of 27 such designated areas in the state. The estimated population of this large 34,319-square mile census area in 2003 was 9,933. This represented 1.5% of Alaska's estimated 2003 population of 648, 818. The census area's population density was 0.3 persons per square mile, versus 1.1 for Alaska. The Valdez-Cordova area's 2003 population declined 2.6% from the 2000 Census population of 10,195, while in contrast, Alaska's population grew 3.5% in the same three years (USCB, 2005).

In 2000, 75% of the population in the Valdez-Cordova census area was non-Hispanic white in racial/ethnic origin, 13% was Alaska Native, 4% was Asian, and 3% was Latino. Only 0.3% was black. Except for blacks, these percentages were comparable to the racial/ethnic composition of the state as a whole; blacks were 10 times more numerous a percentage of the population (3.5%) in Alaska than in the Valdez-Cordova census area.

In the McCarthy Census Designated Place (CDP), the 2000 Census counted 42 residents, all of whom were white, in 26 separate households (USCB, 2000a). The median age was 46 years. Of the 26 households, seven were family households, and four had children under 18. Six residents had disabilities. There were an additional 21 vacant housing units used seasonally, recreationally, or occasionally.

The rural Alaskan character of the McCarthy community is shown by statistics from the 2000 Census. Of 20 occupied housing units, four (20%) were heated with fuel oil or kerosene, 15 (75%) were heated with wood, and one (5%) was heated with solar energy. Ninety percent of the housing units lacked complete plumbing facilities, 70% lacked complete kitchen facilities, and 45% had no telephone service.

Within the Valdez-Cordova census area, educational attainment in 2000 was similar to state levels: 88.5% of the population 25 or older were high school graduates, versus 88.3% of Alaskans; 21% had at least a Bachelor's degree, compared with 25% of all Alaskans. McCarthy had a somewhat more highly educated populace, on average, than either the census area or the state as a whole: 92% (22 of 24 residents) of the residents 25 years and older had at least a high school diploma, and 29% had a Bachelor's degree or higher.

In terms of economic well-being, the census area is similar to the state. The median household income in the Valdez-Cordova census area in 1999 was $48,734 compared to $51,571 among all Alaska residents. The poverty level among census area residents was 9.8%; in Alaska as a whole it was 9.4%. McCarthy had a higher poverty rate – 15% – and a much lower median household income – $17,188 – than either the broader census area or the entire state. Lower median family and household incomes and higher poverty rates are characteristic of remote, rural communities in Alaska and elsewhere that have few employment opportunities. In McCarthy, 41% of the civilian labor force was unemployed. Only 3 people among the 29 residents 16 and older were employed; fully 48% of the population aged 16 and older (14 residents) were not even in the labor force.

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# 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides an evaluation of the potential effects or impacts of each of the alternatives on the resources described in the issue statements presented in Chapter 1, *Purpose and Need for Action.*

## 4.1 METHODOLOGY

The impact analysis has been conducted in a consistent manner based on standardized impact definitions. For each issue or resource, direct, indirect, and cumulative impacts have been characterized as negligible, minor, moderate, or major. Impacts identified for each issue or resource was based on their duration, extent, and intensity. These impact level thresholds are defined below.

**Duration of Impact:**

*Temporary* – Impact would occur during the site preparation and construction phases only. Once construction has ended, resource conditions are likely to return to pre-construction conditions.

*Short-term* – Impact would extend past the construction phase, but would not last more than a couple of years, at most.

*Long-term* – Impact would likely last more than a couple of years, or over the lifetime of the project.

**Extent of Impact:**

*Localized* – Impacts would affect the resource area only on the project site or its immediate surroundings, and would not extend into the region.

*Regional* – Impacts would affect the resource area on a regional level or on the park as a whole, extending well past the immediate project site.

*National* – Impacts would affect the resource area on a national level, extending well past the region or park as a whole.

**Intensity of Impact:**

*Negligible* – Minimal or no impact on the resource area; any change that occurs is neither noticeable nor measurable.

*Minor* – Change in a resource area occurs, but no substantial resource impact results; the change in the resource is barely perceptible and would not alter the condition or appearance of the resource.

*Moderate* – Noticeable change in a resource occurs and this change alters the condition or appearance of the resource, but the integrity of the resource remains intact.

*Major* – Substantial impact or change in a resource area occurs that is easily defined, highly noticeable, and measurably alters the condition or appearance of the resource.

## 4.2 CUMULATIVE IMPACTS

Cumulative impacts were assessed by combining the potential environmental impacts of the alternatives with the potential impacts of known projects that have occurred in the past, are currently occurring, or are projected to occur in the future within the region of the Preferred Alternative. Known past, present, and reasonably foreseeable future projects and actions in the authorized WRST boundary include areas of nonfederal land, past mining development, human habitation, roads, buildings, and land applications that amount to about 1.3 million acres. Known past, current, and reasonably foreseeable future projects and actions in the vicinity of the project site are described below.

### 4.2.1 Past and Present Projects and Actions

Kennecott Mill Town Stabilization and Rehabilitation Work – In 2004, crews working under park supervision made progress in the ongoing effort to stabilize historic buildings in the Kennecott Mill Town. Last year's work focused primarily on the Store/Warehouse, General Manager's Office, Mill Building (including the Ore Chute), the Power Plant, and the National Creek Footbridge. Additional work was performed on the Kennecott and Blackburn Schools.

In the summer of 2005, work is proceeding at several sites, including the Store/Warehouse (which will eventually house the Visitor Center and NHL Administrative Offices), General Manager's Office and Power Plant. At the Store/Warehouse, leveling and foundation repair will be completed and exterior wall repairs will be started. At the General Manager's Office, the oldest standing building in Kennecott, summer 2005 work includes completion of the exterior shell; installation of doors, windows and new paint will also be initiated. At the Power Plant, foundation repair work is taking place on the north end of the building and stabilization of the smoke stacks will be undertaken. Crews will also be working on other projects, including the Mill Building and Recreation Hall. Certain buildings may be restricted or closed to the public during this construction work.

Invasive Non-Native Plants – NPS is developing a program to control invasive non-native plant species. It consists of both educational/outreach and weed pulling work.

National Creek Geomorphic Study – During the summer of 2005, a contractor is conducting hydrologic and geomorphic field work on National Creek. This study will provide information regarding the geomorphic processes in the National Creek watershed, allowing NPS to evaluate the geomorphic risks to potential projects designed to protect the historic structures and cultural integrity of the National Creek drainage. A report will be delivered to the NPS in December 2005.

Interim Park Operations Support Complex – WRST is completing development of this facility in West McCarthy, which consists of cabins and support cabins and bulk storage space.

Opening of Copper River Princess Wilderness Lodge – This 85-room lodge in Copper Center, near the WRST headquarters, opened in 2002, offering guided tours to Kennecott and McCarthy. More broadly, there has been an increase in private sector facilities catering to adventure tourists in the region that both accommodates the growth in visitation to the NHL District and encourages further growth. In the NHL itself, the 25-room Kennicott Glacier Lodge was built in 1987 as a replica of one of the historic mining buildings.

Past Mining and Construction Activities – Extensive copper mining at four upper mountain mine sites and associated land development and disturbance occurred in and around the NHL from 1901 to 1938. These actions, undertaken at a time when measures to protect the environment were all but non-existent, caused widespread, long-term, cumulative impacts in the McCarthy-Kennecott on soils, water resources, hydrology and floodplains, and vegetation, among other resources.

Soils in and near the Kennecott Mill Town and in the town of McCarthy have been altered due to construction of buildings, roads, trails, and other facilities and from accumulation of tailings and oil-stained soil. Past mining at the higher elevation mine sites has also resulted in soil impacts. Besides the actual footprint of these facilities, soils in the immediate surrounding areas have been impacted by compaction from pedestrian and vehicle traffic. Dispersed soil impacts have also been caused by off-trail pedestrian traffic that has resulted in compaction over broad areas and erosion on steeper slopes. Concentrated areas of compaction and erosion often take the form of unofficial social trails.

Widespread disturbance to water resources from past mining activity exists in the Kennecott area. Amazon, Jumbo, Bonanza, and National creeks have all been disturbed since the early1900's by access roads and activities associated with hardrock mining (NPS, 1990). Stream impacts exist from water diversions, in-stream obstructions, and changes in stream morphology, runoff from access roads, and potential water contamination from abandoned hazardous materials.

Extensive disturbance of riparian habitat and interruption of hydrology exists from road construction and material stockpile. Loss of riparian habitat affects both the aquatic and terrestrial habitats through decreased nutrient sources to stream systems, decreased shade and cover for fish, and decreased riparian habitat available for wildlife (NPS, 1990). Changes in physical stream characteristics and removal of riparian vegetation through mining operations and access routes have caused impacts to aquatic biota over time, such as loss of shade, cover, detrital input, and suitable habitat.

Hazardous materials (i.e., asbestos, mine tailings, batteries) present a source of contamination to groundwater and surface water and potential impact to aquatic biota. These materials have existed in the NHL for over 50 years, and leaching from these sources in the past and into the future is a continuing cumulative impact (NPS, 1990).

During the Kennecott mining era, National Creek and its floodplain were intensively altered by mining activity and material stockpiling. These alterations caused hydrologic and hydraulic changes in the fluvial system, floodplain, and wetlands that are evident today. In the vicinity of the mill, the stream channel was confined, dammed and diverted to support milling operations. Water diversion facilities were constructed upstream of the mill. Remnants of these facilities remain, causing blockage and flow restriction during floods. Dams, buildings, and mill tailings in the active floodplain are subject to scour and sediment deposition. Stream gravel has been deposited in the lower levels of two buildings along National Creek. National Creek now has an abundance of both naturally occurring and mining-related debris and sediment accumulation (NPS, 2003b).

Other floodplains in the project area have been disturbed in the past, causing altered water flow. Actions included diverting stream channels away from infrastructure and installing culverts.

Vegetation clearing in the McCarthy-Kennecott area has resulted from construction and maintenance of the McCarthy Road and construction of facilities along the road, such as the west side support complex. Vegetation in and near the Kennecott Mill Town and in the town of McCarthy has been cleared for construction of buildings, roads, trails, and other facilities.

Past mining at the higher elevation mine sites has also resulted in vegetation impacts. Besides the actual footprint of these facilities, plants in the immediate surrounding areas have been impacted by trampling from pedestrian and vehicle traffic. Dispersed vegetation impacts have also been caused by off-trail pedestrian traffic. Concentrated areas of pedestrian traffic often take the form of unofficial social trails where vegetation is often denuded. An additional impact to the vegetation of the area includes a bark beetle infestation in the 1990s which killed many of the mature white spruce trees on the terraces, side slopes and uplands.

Most of the areas where vegetation was historically cleared have stabilized and revegetated on their own to some degree. Before 1900, most areas in the NHL were in some successional stage of white spruce forest, except notably in the vicinity of National Creek. During the development of the Mill Town (1900-1938), logging and clearing of land left the area in various stages of secondary succession. Primary succession was also proceeding on the younger moraines. Both of these processes caused a dramatic increase in the amount of willow and alder in the area, with diminishing spruce forest. The majority of land cleared for mining activities became an area covered with dense shrubs, spruce stumps, slash, and mining debris. Today there is more total vegetation cover than at any time since the start of the mining era. This is due to the ongoing retreat of Kennicott Glacier and the consequent colonization of its lateral moraines. All the vegetation in the NHL is a seral stage of white spruce forest, as it was before the miners arrived. However, a larger proportion of vegetated land is in early to middle succession than it was 100 years ago, and a smaller percentage is in late successional or mature forest.

### 4.2.2 Future Projects and Actions

Each of the projects or actions described above will also be continuing in the future. In addition, the following reasonably foreseeable future actions below also have potential for interacting with the proposed action to produce cumulative impacts:

Walk-in Campground – WRST is planning on developing a walk-in campground on the east side of the Kennicott River on the opposite side of the McCarthy-Kennecott Road from the McCarthy Airport. The chosen site sits on 42 acres in a glacial fluvial outwash and access will be limited to non-motorized methods along a designated trail from the McCarthy-Kennecott Road traversing federal land. It will include vault toilets, bear-resistant trash receptacles, drinking water from a well, and a centralized food preparation area. It also incorporates a number of mitigation measures aimed at minimizing human-bear conflicts.

McCarthy Road Upgrade – ADOT&PF has planned a major upgrade of the McCarthy Road from Chitina to McCarthy. A Scenic Corridor Plan, released in 1997 and described in Section 1.5.2 of this EA, set forth design criteria consistent with NPS park road standards and ADPT&PF standards, as well as proposing a number of interpretive wayside (four in the McCarthy area), scenic overlooks, and trails. The Federal Highway Administration, in cooperation with ADPT&PF, initiated an EIS in 2003 on these proposed improvements. Preliminary alternatives being evaluated in the EIS included the following:

- No build; continued use of the current road, with limited on-going maintenance activities.
- Improving the most serious roadway deficiencies.
- Reconstructing the road to a design speed of 35 mph, considering all or some of the guidelines specified in the ``McCarthy Scenic Corridor Plan."
- Reconstructing the road to a design speed of 50 mph, meeting modern highway standards.
- Hybrid of the previous two alternatives: reconstructing some segments of the road with design speeds of 50 mph and others with 35 mph.

Under each alternative, minor realignments, the location and number of waysides and other enhancement facilities, and the final surfacing of the road (gravel or hard) are being evaluated.

Transfer of State DNR Lands to University of Alaska

Early in 2005, the governor of Alaska introduced bills in the State House and Senate to transfer state DNR lands to the University of Alaska to provide the college with a new source of income in the coming years (Kenyon, 2005). About 12,500 acres near McCarthy are included in the proposal; the land borders the Nizina River, forming a corridor ranging between 1-3 miles in width, running for several miles east of the Nizina Bridge area at MP of the McCarthy Road. These lands are presently used by area residents for subsistence purposes, including hiking, fishing, berry picking, firewood gathering, and obtaining gravel and house logs. If approved, this proposal could potentially lead to sale and subdivision of some of this acreage, with possible restrictions on such subsistence uses. A related bill introduced in the U.S. Senate would require the University of Alaska to relinquish its inholdings in national parks and national wildlife refuges, including WRST, in exchange for selecting other acreage from the federal government.

Hydroelectric Development on Bonanza Creek

The 2003 Kennecott Utilities Study performed a hydroelectric analysis and determined that a hydroelectric facility on Bonanza Creek, where one existed when the Mill Town was booming

80 years ago, would be feasible. A hydroelectric facility would consist of several structures, including a diversion structure and intake site, a pipeline or penstock to transport water from the stream to the powerhouse, the powerhouse itself, containing a turbine and generator, a tailrace and flume to discharge water back into a watercourse (National or Bonanza Creek), and a transmission line that would carry power from the generator to the local grid. Most of these facilities would have to be constructed anew, though it may be possible to reuse the existing, abandoned powerhouse. Hydroelectric development on Bonanza Creek would require further site-specific design engineering and environmental analysis before it could proceed.

## 4.3 NO ACTION ALTERNATIVE

### 4.3.1 Soils and Topography

Under the No Action Alternative, no new actions are planned that would contribute negative impacts to soils. Soil impacts from currently planned improvements that would be implemented, such as the new walk-in campground (1 acre of disturbance) and new housing in the west side support complex in west McCarthy, are described elsewhere (NPS, 2002; NPS, 2003a).

Several practices that are currently occurring would continue to adversely affect soils. Cars would continue to park off-road in the right-of-way east of the Kennicott River and in the NHL due to uncontrolled parking and lack of sufficient designated parking areas, with continuing localized churning and compacting of soils. The rate and extent of current soil impacts (e.g., compaction from foot traffic) would be expected to correspond to visitation levels.

Additional localized soil disturbance, such as compaction and alteration of soil structure, would occur from the already planned sprinkler system for the west side support complex which would require a water storage tank and a trench to each cabin.

Bulk fuel storage at the west side support complex and in the NHL and from above ground storage tanks in NHL could potentially result in localized soil contamination from possible spills. Fuels kill most soil microorganisms and create toxic soil solutions that kill plants and contaminate ground water. Soils recover from spills by the leaching of contaminants from precipitation and natural bioremediation. Toxic effects from spills can last for years depending on soil texture, the volume and type of spill, and rates of biologic activity. Productive soils can also be lost if contaminated soils are excavated and removed during remediation operations. Proper handling of fuel according to regulations would minimize any such soil impacts.

There would be reduced soil erosion and sedimentation of National Creek with the implementation of a plan to fix the cut bank washout for a loop trail enabling the traverse of Silk Stocking Road and the top of the mill complex, which would be a beneficial impact.

*Cumulative Impacts* – Past and future activities can remove soils from production and lead to the loss of soil resources through burial, and wind and water erosion. In most cases the loss of production is temporary and when human occupancy and use is discontinued soil productivity resumes, although at an initially reduced level. Disturbance also changes the original character of native soils by modifying texture, organic matter content and drainage class. Vegetation

regrowth often reflects that change and new growth usually contrasts with surrounding undisturbed sites. The modifications also affect site productivity – in some areas increasing productivity due to improved soil drainage.

The No Action Alternative would have negligible, long-term, localized, adverse impacts to soils from continued soil compaction and erosion. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to soils. Combined with known past, current, and future projects and actions, overall there would be minor to moderate adverse cumulative impacts on soils.

*Conclusion* – The No Action Alternative would have negligible, long-term, localized, adverse impacts to soils from continued soil compaction and erosion. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to soils. The level of impact on soils from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the national park and preserve.

### 4.3.2 Water Resources

Under the No Action Alternative, no new actions are planned that would contribute negative impacts to water resources. However, the lack of action to improve existing facilities could lead to adverse impacts on water resources.

At the NHL, existing plans have not yet been implemented for fixing the cut bank washout at National Creek for a loop trail and several existing trails are overgrown and in poor condition. Increased sediment loads from erosion of these trails would degrade the surface water quality of National Creek and other nearby streams. Additional development of sanitary sewage capacity is needed in the NHL for increased use of historic buildings. Without a new or upgraded septic system and increased use, surface or groundwater contamination could occur from failure of the leach field and septic tank. Lack of sufficient public toilets on the north side of the NHL and on the west side of the Kennicott River near the footbridge could lead to surface water contamination with fecal coliform bacteria from improper disposal of human waste near streams.

Additionally, there is potential for groundwater contamination from possible leaks or spills from bulk fuel storage at the west side support complex and in the NHL and from above ground fuel storage tanks in the NHL. Proper handling of fuel according to regulations would minimize any ground or surface water impacts.

*Cumulative Impacts* – The No Action Alternative would have negligible, long-term, localized, adverse impacts on water resources from continued stream sedimentation and possible water contamination. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to water resources. Combined with known past, current, and future projects and actions, overall there would be moderate adverse cumulative impacts on water resources.

*Conclusion* – The No Action Alternative would have negligible, long-term, localized, adverse impacts on water resources from continued stream sedimentation and possible water contamination. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to water resources. The level of impact on water resources from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the national park and preserve.

### 4.3.3 Floodplains

Under the No Action Alternative, no new actions are planned that would contribute impacts to floodplains.

*Cumulative Impacts* – The No Action Alternative would have negligible, long-term, localized, adverse impacts on floodplains. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to floodplains. Combined with known past, current, and future projects and actions, overall there would be moderate adverse cumulative impacts on floodplains.

*Conclusion* – The No Action Alternative would have negligible, long-term, localized, adverse impacts on floodplains. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to floodplains. The level of impact on floodplains from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.3.4 Vegetation

Under the No Action Alternative, no new actions are planned that would contribute negative impacts to vegetation. Vegetation impacts from currently planned improvements that would be implemented, such as the new walk-in campground (1 acre of disturbance) and new housing in the west side support complex in West McCarthy, are described elsewhere (NPS, 2002; NPS, 2003).

Several practices that are currently occurring would continue to adversely affect vegetation. Cars would continue to park off-road in the right-of-way east of the Kennicott River and in the NHL due to uncontrolled parking and lack of sufficient designated parking areas, with continuing destruction of vegetation. Without the implementation of an exotic plant management plan, the pressure of invasive vegetation on native flora would increase within the NHL and the park. Limited fire suppression capabilities could lead to burning of vegetation if there is a fire in the NHL and at the west side support complex. The rate and extent of current vegetation impacts (e.g., trampling of plants due to foot traffic) would be expected to correspond with visitation levels.

Vegetation disturbance, such as trampling and removal, would occur from the already planned sprinkler system for the west side support complex which would require a water storage tank and a trench to each cabin.

*Cumulative Impacts* – As discussed in Section 4.2.1, vegetation in and near the Kennecott Mill Town and in the town of McCarthy was cleared for construction of buildings, roads, trails, and other facilities. Vegetation continues to be selectively thinned at the Mill Town to reestablish historic views and to mitigate potential damage to historic structures. Vegetation that now encroaches on historic structures in the NHL could be removed in the future to assure preservation of cultural resources and to enhance the historic character of the mill town. Vegetable gardens, which consist of non-native plants but were part of the historic landscape, may in the future be reestablished. Selective thinning of vegetation can occur on NPS properties in the NHL to reestablish historic views and viewsheds and to protect the site from the effects of fire and damage to buildings (Gilbert et al., 2001). NPS is working with private property owners who want to conduct selective thinning on their land in a manner consistent with historic district goals.

The No Action Alternative would have minor, long-term, localized, adverse impacts to vegetation from continued vegetation trampling and spread of exotic plants. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to vegetation. Combined with known past, current, and future projects and actions, overall there would be moderate adverse cumulative impacts on vegetation.

*Conclusion* – The No Action Alternative would have minor, long-term, localized, adverse impacts to vegetation from continued vegetation trampling and spread of exotic plants. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts to vegetation. The level of impact on vegetation from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.3.5 Wildlife

Under the No Action Alternative, no new actions are planned that would contribute negative impacts to wildlife and wildlife habitat. However, the lack of a household waste disposal system could mean that there would be continued bear attractants available, such as food and trash. Currently, bear resistant trash cans at the McCarthy Road Information Station and in the NHL are for NPS use only. All other parties, including contractors and visitors, are likely contributing to the problems associated with bears obtaining human food, as described under Wildlife in the Affected Environment chapter, due to lack of adequate waste disposal facilities. The availability of unsecured bear attractants could increase and the potential for human-bear conflicts would increase as would injuries and bear mortality.

*Cumulative Impacts* – Past mining activity; past, present, and future subsistence and sport hunting; past, present, and future development; past, present, and future inholder access; past, present, and future visitation all contribute to cumulative impacts on wildlife. These actions

have resulted in long and short-term habitat loss, displacement of wildlife, increased human-bear conflicts, and increased bear mortality.

Past human activity and development on federal, state, and private lands in the area have directly affected wildlife habitat. Collectively, future developments in the McCarthy area would cause additional habitat alteration. The cumulative impact on wildlife habitat from ongoing and future actions would be negligible because of the extensive amount of wildlife habitat that exists in the national park and preserve.

The No Action Alternative would have minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from continued human-bear conflicts. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts on wildlife and wildlife habitat. Combined with known past, current, and future projects and actions, overall there would be moderate, adverse cumulative impacts on wildlife.

*Conclusion* – The No Action Alternative would have minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from continued human-bear conflicts. Implementation of the No Action Alternative would likely contribute negligible, long-term, adverse cumulative impacts on wildlife and wildlife habitat. The level of impact on wildlife and wildlife habitat from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.3.6 Cultural Resources

*Cultural Landscapes* **–** Under the No Action Alternative, ongoing efforts to stabilize and rehabilitate structures in the NHL that contribute to the cultural landscape would continue, producing a moderately beneficial impact on the cultural landscape. However, this benefit would be offset partially by the continuation of other current circumstances in the NHL, such as vegetation encroachment and visually intrusive elements including blue tarps covering supplies and propane tanks. NPS would continue to use the diesel generator, which does not fit within the historic context of the area, to bring power to several buildings within the NHL. These elements would continue to detract from the character of the cultural landscape at Kennecott.

National Creek trestle rehabilitation would prevent further damage to the NHL's historic resources. Channelizing the creek would reduce its encroachment on cultural resources and benefit the historic character of the cultural landscape.

Outside the NHL, the No Action Alternative would have little or no effect on the cultural landscape of McCarthy, the McCarthy Road, the wagon road, and other historic areas.

*Archeological Resources* – Significant archeological resources in the NHL include collapsed buildings, pipelines, large industrial artifacts (e.g. mining equipment, remnant cable, machinery), dumps, and equipment storage piles. The No Action Alternative would have a negligible impact on the long-term condition of archeological resources in the NHL.

Outside the NHL, the No Action Alternative would have no effects on archeological resources.

*Historic Structures and Buildings* – Within the NHL, historic structures include boardwalks, dams, bridges, tram towers, and landscape features such as tailings piles. Of 70 standing buildings in the NHL, 14 major ones have been acquired by NPS; all are constructed of wood and their condition varies from poor to fair. If the NPS could purchase any of the six privately owned historic houses remaining in the NHL, they would be rehabilitated to provide additional employee housing. Ongoing stabilization and rehabilitation activities, and planned National Creek trestle rehabilitation, both which would continue under the No Action Alternative, would result in a long-term moderately beneficial impact on historic structures and buildings in the NHL.

With very limited fire suppression capabilities, there would be a low probability of saving structures from fire. The benefits of stabilization and rehabilitation activities would be somewhat offset by this adverse effect.

Outside the NHL, the No Action Alternative would have no effect on historic structures and buildings.

*Cultural Objects, Museum Collections and Archives* – The No Action Alternative would maintain current preservation practices and procedures with regard to artifacts and cultural objects like tools, domestic items, remnants of larger features, wooden pipes, equipment, and machinery parts. Metallic objects would remain stable but wooden objects would continue weathering-related deterioration. With very limited fire suppression capabilities, there would be a low probability saving objects, collections, and archives from fire.

*Cumulative Impacts* – Past, present, and future actions would all contribute to cumulative impacts on cultural resources in the Kennecott Mill Town NHL. By and large, due primarily to the extensive and intensive ongoing efforts by NPS at building and structure stabilization and rehabilitation, these cumulative cultural resources impacts in the NHL would be moderately beneficial, especially in terms of the cultural landscape and historic structures and buildings.

Overall, the No Action Alternative would produce moderately beneficial, long-term, localized, impacts on cultural resources. Combined with known past, current, and future projects and actions, overall there would be moderately beneficial, cumulative impacts on cultural resources.

*Conclusion* – Overall, the No Action Alternative would produce moderately beneficial, long-term, localized, impacts on cultural resources. Implementation of the No Action Alternative would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources. The level of impact on cultural resources from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.3.7 Visual Resources

Under the No Action Alternative, broader visual resources in the McCarthy-Kennecott area would remain outstanding. Within the NHL itself, visual resources relate primarily to the cultural-historic character of the Mill Town. Ongoing work to stabilize and rehabilitate deteriorating structures and buildings in the Mill Town will, over the long term, serve to retain the site's visual resources; thus, under the No Action Alternative, there would be moderately beneficial, localized, long-term impacts on visual resources. In the short term, the work itself and the storage and movement of supplies related to it would have minor, localized adverse effects on visual resources. Also, vegetation encroachment would continue to impinge upon viewsheds, somewhat offsetting the overall long-term beneficial effects of stabilizing Mill Town structures.

*Cumulative Impacts* – Some existing, non-contributing, incompatible development in and around the NHL would continue to have a moderately adverse, long-term impact on Kennecott's visual resources. The additional contribution of moderately beneficial, long-term impacts from NPS stabilization and rehabilitation of historic structures would produce a net minor, beneficial cumulative effect on the visual environment.

*Conclusion* – Overall, the No Action Alternative would produce moderately beneficial, long-term, localized, impacts on visual resources. Implementation of the No Action Alternative would likely contribute moderately beneficial, long-term, localized cumulative impacts on visual resources. The level of impact on visual resources from the No Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.3.8 Visitor Use and Experience

Under the No Action Alternative, facilities and services to accommodate an increasing number of visitors to Kennecott-McCarthy would continue to be limited. There would continue to be no welcome sign for visitors and no overall indication at having arrived in the historic district. While some visitor facilities would continue to be provided, obtaining information on services and activities would remain difficult. Incidents of accidental trespass on the patchwork of private property in the area would likely continue because of the lack of readily available information about land ownership patterns. The inconspicuous, set-back location of the McCarthy Road Information Station along the McCarthy Road west of the Kennicott River would continue to elude some arriving, first-time visitors. Also, staffing of the information station would continue to be limited to eight hours per day, seven days per week, Memorial Day to Labor Day, which would not serve those visitors arriving in the area earlier or later in the day or year.

Reaching the NHL from the Kennicott River would continue to be time-consuming or inconvenient for some visitors. In addition, confusing parking arrangements at the river might continue to occasionally result in conflicts between visitors and private property owners.

Within the NHL itself, existing and already planned visitor facilities and services that would proceed under the No Action Alternative would likely be able to accommodate most but not all expected increases in visitation. While the existing Depot visitor center is small, the much larger Kennecott Company Store is being developed as the primary visitor destination. Over the short term, ongoing stabilization and rehabilitation activities may interfere somewhat with visitor enjoyment of individual structures and buildings, but over the longer term, this preservation work would enhance the quality of the visitor experience. The limited network of overgrown, poorly maintained trails inhibits full mobility of pedestrian visitors in the NHL and limits opportunities to more fully explore and appreciate the setting.

Under the No Action Alternative, existing and planned public toilets would be sufficient in much of the NHL, at least during normal operating hours, but there would be an inadequate number of public toilets on the north side of the NHL, and there would continue to be no public toilets on the west side of the Kennicott River at the footbridge. The new walk-in campground would include vault toilets for campers.

Overall, the No Action Alternative would only partially meet the various needs of growing visitation to the area, thus compromising visitor use and experience. It would fall short of meeting the park's Mission Goal IIa (*Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities*) and Mission Goal IIb (*Park visitors and the general public understand and appreciate the preservation of parks and their resources for this and future generations*). Thus, the No Action Alternative would have a minor adverse, long-term impact on visitor use and experience at the Kennecott area of WRST.

*Cumulative Impacts* – The principal outcome of other actions such as the McCarthy Road upgrade, increasing private sector investment in lodging and other tourism ventures, and the new walk-in campground will be to foster growth in the number of visitors coming to McCarthy-Kennecott. The cumulative impact of these actions on visitor use and experience would be moderately beneficial, in that the area does not appear to have reached its theoretical recreational carrying capacity. However, given its limited visitor facilities and services, such growth in visitation would probably exacerbate existing problems that even now limit safe enjoyment of the area by the visiting public. Thus, the overall cumulative impact on visitor use and experience of proceeding with the No Action Alternative would be moderately adverse and long-term.

*Conclusion* – The No Action Alternative would have a minor adverse, long-term impact on visitor use and experience at the Kennecott area of WRST. In addition, it would interact with other ongoing and future actions to generate moderately adverse, long-term cumulative impacts.

### 4.3.9 Transportation and Access

The No Action Alternative would limit transportation and access as follows:

- NPS would be unable to participate in road maintenance between the NHL and the Kennicott River and inadequate maintenance and unacceptable safety problems would

persist. This single-lane road would continue to lack wide spots allowing for vehicles passing in the same or opposite direction to pass or cross safely.
- Vehicle parking west of Kennicott River at McCarthy Road Information Station would remain limited to 8-10 parking spaces.
- Vehicle parking east of the Kennicott River within the state right-of-way would remain limited and uncontrolled, with no designated spaces.
- Within the Kennecott NHL, uncontrolled parking would continue along the rail corridor adjacent to the Kennicott Glacier Lodge and along the lower glacier road behind the Recreation Hall.
- There would continue to be no designated turnaround area or visitor drop-off.
- Privately operated van shuttles would continue to be the only method for visitors to get from the Kennicott River to McCarthy or the NHL. These shuttles would not generally run early or late in the day (except for special requests), and may be unable to adequately accommodate wheelchairs or to transport bicycles.
- There would not be designated shuttle stops.

The No Action Alternative would have moderate adverse long-term impacts on transportation and access.

*Cumulative Impacts* **–** The most important implications for cumulative transportation-related impacts derive from the proposed McCarthy Road upgrade and other private-sector and NPS investments which would have the net effect of boosting visitation and traffic in the McCarthy-Kennecott area. The former action would improve the McCarthy Road, increase safe travel speeds, enhance interpretive and recreational opportunities, and overall, facilitate greater visitation. NPS work in the NHL and private-sector investment in tourist lodging and outings would also attract more visitors to the area. Since the No Action Alternative would not address existing limitations on road maintenance, vehicle parking, and local transportation options for visitors, there would be moderate adverse long-term cumulative impacts on transportation and access.

*Conclusion* **–** The No Action Alternative would result in long-term, moderately adverse impacts on transportation and access. There would be moderate adverse long-term cumulative impacts.

### 4.3.10 Utilities and Related Services

Under the No Action Alternative, most NPS utilities and services would remain as they are at present, while several others (those already planned or under construction already) would be improved, expanded or added. However, there would still be several limitations, including the following:

- Within the NHL, the 20 KVA diesel generator and underground lines NPS uses to bring power to certain buildings would not have the capacity to meet projected electricity demand.
- Two existing septic systems in the NHL would be undersized to handle anticipated increases in visitation and new facilities that would be connected to these systems.

- Very limited fire suppression capabilities in the NHL would persist, placing both humans and historic structures at risk from fires.
- Most drinking water in the NHL would continue to be bottled water for purchase, and the drinking water supply system with water collected from National Creek would continue to be limited in volume and difficult to maintain.
- There would continue to be no comprehensive, long-term solution for waste management, including disposal of construction debris.
- There would continue to be no potentially combined waste management solution for McCarthy, NPS and other residents in the area.

While the No Action Alternative would not directly exacerbate these problems, by not providing a satisfactory solution to them, it would constitute a moderately adverse, long-term impact on utilities and related services.

*Cumulative Impacts* **–** NPS would continue to generate a household waste stream from normal operations as well as, for the foreseeable future, construction debris from stabilization and rehabilitation efforts in the NHL. Rising visitation to the area, encouraged by other actions, would increase local waste generation in and around McCarthy as well. Without a comprehensive waste management system to handle larger waste streams for the entire McCarthy-Kennecott area, the area may continue to be constrained by limited capability for waste disposal. Similarly, not having sufficient wastewater treatment and disposal capacity could cause localized groundwater contamination and affect adjacent development within the NHL. Overall, then, the No Action Alternative would result in moderately severe, long-term impacts on utilities and related services.

*Conclusion* **–** The No Action Alternative would result in long-term, moderately adverse impacts on utilities and related services in the McCarthy-Kennecott area. Cumulative impacts from other actions combined with the No Action Alternative would also be moderately adverse and long term.

### 4.3.11 Socioeconomic Environment

The No Action Alternative would have a negligible direct effect on the socioeconomic environment of the McCarthy-Kennecott area. It would neither increase nor decrease employment, nor would it add to or subtract from the tax base or inject new funds into the local economy from direct and indirect spending on goods and services. Similarly, it would not place any new burdens on existing social systems, such as education, medical or housing. Indirectly, however, the No Action Alternative would result in minor, long-term adverse impacts, by not allowing for the necessary infrastructure, facilities and services to accommodate projected growth of tourism in McCarthy-Kennecott and visitation to the NHL.

*Cumulative Impacts* – As described elsewhere, other reasonably foreseeable actions would have the net effect of increasing tourism in the area and visitation to the Kennecott National Historic Landmark. McCarthy residents appear generally supportive of this prospect, provided that it is well planned and provided for and that their concerns are addressed. Thus, cumulatively, these other actions together would create a moderately beneficial, long-term impact for the

socioeconomic environment of the McCarthy community. However, if NPS were not to increase the capacity of infrastructure, facilities and support services to meet rising projected demand, it could potentially hinder this anticipated growth or exacerbate its negative consequences (e.g. increased traffic congestion, parking conflicts, bear encounters, trespassing, etc.). Thus, the No Action Alternative would partially offset expected cumulative socioeconomic benefits from other actions.

*Conclusion* **–** The No Action Alternative would result in long-term, minor adverse impacts on the socioeconomic environment of the McCarthy-Kennecott area. In contrast, cumulative impacts from other actions would generally be moderately beneficial and long term. When considered in combination with the other actions, the No Action Alternative would detract from anticipated cumulative socioeconomic benefits for the area because existing facilities and services would not be able to accommodate projected growth in visitation, leading to probable dissatisfaction on the part of residents and visitors alike.

## 4.4 PROPOSED ACTION ALTERNATIVE

### 4.4.1 Soils and Topography

New areas of soil disturbance would occur from construction of several new facilities under the Preferred Alternative. The majority of disturbance would occur in previously disturbed areas, minimizing soil impacts.

New housing units to be constructed at the west side Operations Support Complex, including construction of new parking lots (0.5 acre of disturbance) and pads supporting new vault toilets (< 0.1 acre of disturbance), would have direct, localized impacts on soils. These actions would compact and destroy the function of the organic soil horizon and mineral soils. Removal of the vegetation mat and grading during construction would expose mineral soils to potential erosion during storm events. Increased foot traffic adjacent to new structures could compact or churn soils. Soil porosity could decrease and water could pond on flat or depressed surfaces. Disturbed soils on the margins of gravel or paved surfaces would be more easily eroded and increased sediment could be carried into nearby streams. These impacts would change the area's biological productivity as much of the ground surface would be covered by non-native building materials.

Soil disturbance, such as compaction and alteration of soil structure, would occur in localized areas from installation/burial of propane tanks (< 0.1 acre) in the NHL, expanding the leach field (0.12 to 0.16 acre) in the NHL, drilling new wells (< 0.1 acre) in the NHL, installing a new well and septic system (< 0.1 acre) at the NPS cabin in McCarthy, developing a fire suppression system in the NHL, and installing the already planned sprinkler system for the west side support complex which would include a water storage tank and a trench to each cabin. Disruption of organic and mineral horizons and removal of the vegetation mat could lead to exposure of mineral soils and potential erosion and increased sediment carried into nearby streams. Soil compaction from foot traffic may occur during construction/installation activities.

Bulk fuel storage at the west side support complex and buried propane tanks in the NHL could result in soil contamination from possible leaks and spills. Fuels kill most soil microorganisms and create toxic soil solutions that kill plants and contaminate ground water. Soils recover from spills by the leaching of contaminants from precipitation and natural bioremediation. Toxic effects from spills can last for years depending on soil texture, the volume and type of spill, and rates of biologic activity. Soils can also be lost from productivity if contaminated soils are excavated and removed during remediation operations. However, with bulk fuel no longer being stored in the NHL, the potential for fuel spills would be decreased. Proper handling of fuel according to regulations would minimize any soil impacts.

The cutting and filling needed to construct new hiking trails could result in increased soil erosion on 0.5 acre. Soil impacts would be localized and include compaction and churning. Trail users stepping off the trails as necessary for passing, resting, etc. would cause compaction beyond the actual trail tread. Installation of new signs for visitor orientation, installation of a new water storage tanks, and ten new shuttle stops would cause minimal soil disturbance where the structures are anchored into the ground (< 0.25 acre). Increased visitation, which may occur from improved visitor services, could result in development of social trails with associated soil compaction and erosion.

Erosion from construction of new facilities would be minimized by implementation of erosion and sediment controls before and after construction. All disturbed areas would be revegetated after construction to stabilize soils over the long-term.

*Cumulative Impacts* – Past and future activities can remove soils from production and lead to the loss of soil resources through burial, and wind and water erosion. In most cases the loss of production is temporary and when human occupancy and use is discontinued soil productivity resumes, although at an initially reduced level. Disturbance also changes the original character of native soils by modifying texture, organic matter content and drainage class. Vegetation regrowth often reflects that change and new growth usually contrasts with surrounding undisturbed sites. The modifications also affect site productivity, in some areas increasing productivity due to improved soil drainage.

The Proposed Action Alternative would have minor, mostly short-term, localized, adverse impacts to soils from construction of new facilities. Implementation of the Proposed Action would likely contribute minor, long-term, adverse cumulative impacts to soils. Combined with known past, current, and future projects and actions, there would be moderate adverse cumulative impacts on soils.

*Conclusion* – The Proposed Action Alternative would have minor, mostly short-term, localized, adverse impacts to soils from construction of new facilities. Implementation of the Proposed Action would likely contribute minor, long-term, adverse cumulative impacts to soils. The level of impact on soils from the Proposed Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.2 Water Resources

Additional housing in the Operations Support Complex on the west side would continue to use the newly installed septic tank and leach field for long-term onsite disposal of sewage. This new system accommodates existing and future planned housing. However, depending on the amount of housing constructed, modifications would be required to the existing septic system, or too much demand could lead to groundwater contamination from coliform bacteria and nitrates if the system fails. Additionally, water quality would be protected with the expanded leach field in the NHL and the new septic system at the NPS cabin in McCarthy, unless the systems fail. Additional vault toilet facilities would constitute a benefit to surface water quality as it would be less likely that human waste would be disposed of near streams.

Bulk fuel storage at the west side support complex and buried propane tanks in the NHL could result in groundwater or surface water contamination from possible leaks and spills. However, with bulk fuel no longer being stored in the NHL, the potential for fuel spills would be decreased. Proper handling of fuel according to regulations would minimize any ground or surface water impacts.

As described above under Soils, construction of new facilities could result in more easily eroded soils and increased sediment could be carried into nearby streams, thus affecting water quality and aquatic habitat. Since much of construction disturbance would occur near surface water, the potential for uncontrolled sediment runoff is high. However, erosion and sediment controls implemented before and after construction would minimize runoff to surface waters. All disturbed areas would be revegetated after construction to stabilize soils, reducing long-term erosion and sedimentation. Fuels products (petroleum, oils, and lubricants) would be needed to operate some of the equipment used in construction; therefore, there is some risk of an accidental fuel or chemical spill, which could adversely affect water quality if the spill were to enter surface water. An emergency spill kit, containing absorption pads, absorbent material, a shovel or rake, and other cleanup items, would be readily available on-site in the event of an accidental spill.

*Cumulative Impacts* – See Section 4.2. for a discussion of past and potential future cumulative impacts on water resources. The Proposed Action would have minor, long-term, localized, adverse impacts on water resources from stream sedimentation and possible water contamination. Implementation of the Proposed Action Alternative would likely contribute minor, long-term, adverse cumulative impacts to water resources. Combined with known past, current, and future projects and actions, there would be moderate, adverse cumulative impacts on water resources.

*Conclusion* – The Proposed Action would have minor, long-term, localized, adverse impacts on water resources from stream sedimentation and possible water contamination. Implementation of the Proposed Action Alternative would likely contribute minor, long-term, adverse cumulative impacts to water resources. The level of impact on water resources from the Proposed Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.3 Floodplains

Many of the existing facilities in the McCarthy-Kennecott area have historically been located within floodplains. Proposed new facilities, such as new housing in the west side support complex, trails, parking lots, septic systems, and a fire suppression system would occur alongside existing structures in floodplains. Construction of these facilities could further alter the natural floodplain hydrology of the area. Construction of these facilities may require fill, such as gravel, to be added to elevate foundations, berming, ditching, and installing drainage systems as needed.

Under the Proposed Action, National Creek trestle rehabilitation would include clearing of debris out of an adjacent stream to help channelize the creek and prevent bank erosion. NPS would also rechannelize National Creek to reduce erosion, flooding, and the damage they cause. This would represent a beneficial impact on one particular floodplain, although on balance, net direct impacts from the Proposed Action would be minor adverse, localized and long term.

*Cumulative Impacts* – The Proposed Action would have minor, long-term, localized, adverse impacts on floodplains in general, but rechannelization of National Creek would represent a beneficial impact at that site, one that would reduce the flood hazard by clearing debris and other steps. Implementation of this alternative would likely contribute minor, long-term, adverse cumulative impacts to floodplains. Combined with known past, current, and future projects and actions, there would be moderate adverse cumulative impacts on floodplains.

*Conclusion* – The Proposed Action would have minor, long-term, localized, adverse impacts on floodplains in general, but rechannelization of National Creek would represent a beneficial impact at that site, one that would reduce the flood hazard by clearing debris and other steps. Implementation of this alternative would likely contribute minor, long-term, adverse cumulative impacts to floodplains. The level of impact on floodplains from the Proposed Action would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.4 Vegetation

Trees, shrubs, and ground cover would be cleared and/or trampled during construction or installation of new housing in the west side Operations Support Complex, buried propane tanks, wells and septic systems, buried water lines, water tanks, water containment structure, trails, vault toilets, and parking lots (minimum1 acre). Structures could be sited in open areas to reduce impacts. Long-term maintenance of new facilities could require trimming of vegetation. Trees and other vegetation would be removed to improve visibility of the McCarthy Road Information Station (0.25 acre). Vegetation trampling from foot traffic may occur during construction, installation and maintenance activities. Increased visitation, which may occur from improved visitor services, could result in development of social trails with associated vegetation damage.

Exotic plants may find new avenues for invasion of undisturbed areas with the construction of new trails and other facilities. Fill brought in for new construction could result in the introduction and spread of new exotic vegetation seeds. An indirect impact of increased

visitation includes the increased possibility for the introduction of exotic plants via seeds which may be carried by boots, tire treads, or other equipment. However, the implementation of an exotic vegetation management plan would direct efforts at containing and controlling the introduction and spread of exotic plant species.

Benefits to vegetation would occur from the fire suppression systems in both the NHL and west side support complex if fires are put out in buildings before they could spread to outside vegetation. Another benefit would be from additional parking facilities, as there would be reduced disturbance of roadside plants from current uncontrolled parking.

Sites for construction of new facilities and installation of new equipment would be surveyed for the presence of rare species of plants prior to ground disturbance. In the event that rare species are positively identified within the area of disturbance, impacts could be mitigated by avoidance. Additionally, areas denuded of plants would be restored via revegetation or reseeding with seed from local sources.

*Cumulative Impacts* – Overall, the Proposed Action Alternative would have minor, long-term, localized, adverse impacts to vegetation from vegetation clearing and trampling. Implementation of the Proposed Action Alternative would likely contribute minor, long-term, adverse cumulative impacts to vegetation. Combined with known past, current, and future projects and actions, there would be moderate adverse cumulative impacts on vegetation.

*Conclusion* – Overall, the Proposed Action Alternative would have minor, long-term, localized, adverse impacts to vegetation from vegetation clearing and trampling. Implementation of the Proposed Action Alternative would likely contribute minor, long-term, adverse cumulative impacts to vegetation. The level of impact on vegetation from the Proposed Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.5 Wildlife

The construction or installation of new housing in the west side Operations Support Complex, buried propane tanks, well and septic systems, buried water lines, water tanks, water containment structure, vault toilets, trails, and parking lots would cause temporary to short-term displacement of wildlife during periods of construction activity and permanently decrease available wildlife habitat in small, localized areas (minimum 1 acre). The indirect impacts of short-term habitat losses are decreased availability of food and prey species, temporary changes in wildlife distribution, increased competition for food, inefficient use of habitat, and altered movement and activity patterns. Wildlife could be disturbed and displaced by the noise and activity surrounding construction sites for up to eight hours per day for as long as it takes to complete the work (several days to several months). Concentrating human use in wildlife habitat during construction, and subsequently visitor use, could permanently displace some species, but it is unlikely that habitat would be rendered non-functional or that any species' population as a whole would be extirpated from the area as there would remain many areas that humans do not concentrate in.

Impacts to wildlife from new trails would be primarily behavioral responses to approaching hikers and from habitat alterations, habitat fragmentation, and any habitat loss due to trail construction. Behavioral responses may include flight from approaching hikers, avoidance of trail areas, habituation to humans, association of humans with food, and adjustment of timing to activities such as feeding. Behavioral responses are of short duration, only having an impact while the particular behavior is elicited. However, prolonged or repeated disturbance may lead to long-term or permanent disruptions, particularly if the response disrupts breeding, displaces wildlife from critical resources, reduces rearing success, or alters mortality rates through factors such as predation and defense of life and property (DLP) killings of bears. New trails could also impact wildlife travel corridors, and fragmented habitat could facilitate the encroachment of edge species.

The Proposed Action Alternative could reduce the potential for human-bear conflicts with improved solid waste management. However, increased visitation, which may occur from improved visitor services, could increase bear attractants (food and food odors) and, subsequently, occurrences of human-bear conflicts. If human-bear conflicts increase, the result could be increased direct and indirect injury and mortality of black and brown (grizzly) bears.

*Cumulative Impacts* – The Proposed Action would have minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from disturbance of wildlife and loss of wildlife habitat with construction of new facilities and from possible continued human-bear conflicts. Implementation of the Proposed Action Alternative would likely contribute minor long-term, adverse cumulative impacts on wildlife and wildlife habitat. Combined with known past, current, and future projects and actions, there would be moderate adverse cumulative impacts on wildlife.

*Conclusion* – The Proposed Action would have minor, long-term, localized, adverse impacts on wildlife and wildlife habitat from disturbance of wildlife and loss of wildlife habitat with construction of new facilities and from possible continued human-bear conflicts. Implementation of the Proposed Action Alternative would likely contribute minor long-term, adverse cumulative impacts on wildlife and wildlife habitat. The level of impact on wildlife and wildlife habitat from the Proposed Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.6 Cultural Resources

*Cultural Landscapes* **–** Under the Proposed Action Alternative, ongoing efforts to stabilize and rehabilitate structures in the NHL that contribute to the cultural landscape would continue, generating a moderately beneficial, long-term impact on the cultural landscape, although with some minor short-term adverse effects from construction activity. Removal of encroaching vegetation and some reduction of visually intrusive elements would further benefit the NHL cultural landscape over the long term. Visually unobtrusive actions, such as storage of materials in structures that blend with the historic character of the landscape, would be implemented. Burial of above ground storage tanks would further reduce visually intrusive elements.

Under this alternative, NPS would approve the concept of a hydroelectric generation facility, consisting of several structures, on Bonanza or National Creeks as the main source of electrical power within the NHL. Most of these facilities would have to be constructed anew, though if Bonanza Creek is used it may be possible to reuse the existing powerhouse. Until such time as this could be implemented, NPS would continue to use the diesel generator, which does not fit within the historic context of the area. These elements could detract from the character of the cultural landscape at Kennecott if they are not constructed to blend in or resemble structures from the original power facility. However, if implemented in a culturally sensitive manner, the restoration of a hydroelectric facility would enhance the integrity of the cultural landscape.

Improved initial attack capabilities and a new fire suppression system would highly increase the probability of saving structures from fire damage, thus adding beneficial effects to preserving the historic character of the cultural landscape. However, visually intrusive structures associated with the fire suppression system, such as hydrants and water tanks, would detract somewhat from the aesthetics of the cultural landscape.

Any new restroom facilities or outhouses and vehicle turnaround that would be located in the NHL could be visually intrusive locally and detract somewhat from the historic character of the landscape.

National Creek trestle rehabilitation would prevent further damage to the NHL's historic resources. Channelizing the creek would reduce its encroachment on cultural resources and benefit the historic character of the cultural landscape.

Outside the NHL, the Proposed Action would have little or no effect on the cultural landscape of McCarthy and the McCarthy Road, but it would seek to preserve the historically important wagon road, rail corridor, and other historic sites.

*Archeological Resources* – Significant archeological resources in the NHL include collapsed buildings, pipelines, large industrial artifacts (e.g. mining equipment, remnant cable, machinery), dumps, and equipment storage piles. Any ground disturbance, such as burial of propane tanks and water lines or drilling of wells could uncover below ground archeological resources. The Proposed Action Alternative would have a negligible impact on the long-term condition of archeological resources in the NHL.

Outside the NHL, the Proposed Action would have no effects on archeological resources.

*Historic Structures and Buildings* – Within the NHL, historic structures include boardwalks, dams, bridges, tram towers, and landscape features such as tailings piles. Of 70 standing buildings in the NHL, 14 major ones have been acquired by NPS; all are constructed of wood and their condition varies from poor to fair. If the NPS could purchase any of the six privately owned historic houses remaining in the NHL, they would be rehabilitated to provide additional employee housing. Ongoing stabilization and rehabilitation activities, which would continue under the Proposed Action, would result in a long-term moderately beneficial impact on historic structures and buildings in the NHL.

Improved initial attack capabilities and a new fire suppression system would highly increase the probability of saving structures from fire damage, thus adding another beneficial impact.

Outside the NHL, the Proposed Action Alternative would have no effect on historic structures and buildings.

*Cultural Objects, Museum Collections and Archives* – The Proposed Action Alternative would maintain current preservation practices and procedures with regard to artifacts and cultural objects like tools, domestic items, remnants of larger features, wooden pipes, equipment, and machinery parts. Metallic objects would remain stable but wooden objects would continue weathering-related deterioration. Improved initial attack capabilities and a new fire suppression system would highly increase the probability of saving objects, collections, and archives from fire damage.

*Cumulative Impacts* – Past, present, and future actions would all contribute to cumulative impacts on cultural resources in the Kennecott Mill Town NHL. By and large, due primarily to the extensive and intensive ongoing efforts by NPS at building and structure stabilization and rehabilitation, these cumulative cultural resources impacts in the NHL would be moderately beneficial, especially in terms of the cultural landscape and historic structures and buildings.

*Conclusion* – Overall, the Proposed Action Alternative would produce moderately beneficial, long-term, localized, impacts on cultural resources. Relative to the No Action Alternative, the Proposed Action would have a greater positive impact on cultural resources. Implementation of the Proposed Action would likely contribute moderately beneficial, long-term, localized cumulative impacts on cultural resources. The level of impact on cultural resources from the Proposed Action Alternative would not result in impairment of park resources that fulfill specific purposes identified in the WRST enabling legislation or that are key to the natural and cultural integrity of the park and preserve.

### 4.4.7 Visual Resources

Under the Proposed Action Alternative, broader visual resources in the McCarthy-Kennecott area would remain outstanding. Within the NHL itself, visual resources relate primarily to the cultural-historic character of the Mill Town. Ongoing work to stabilize and rehabilitate deteriorating structures and buildings in the Mill Town would, over the long term, serve to retain the site's visual resources. Reducing vegetation encroachment that now impinges on viewsheds would also improve visual resources in the NHL, by making more structures, and the Mill Town as a whole, more visible. Thus, the Proposed Action would yield moderately beneficial, localized, long-term impacts on visual resources. In the short term, the work itself and the storage and movement of supplies related to it would have localized adverse effects on visual resources. However, under this alternative, efforts would be made to conceal stored equipment and supplies, or otherwise mitigate their visual obtrusiveness, reducing scenic impacts of ongoing construction from minor to negligible.

*Cumulative Impacts* – Some existing, non-contributing, incompatible development in and around the NHL would continue to have a moderately adverse, long-term impact on Kennecott's visual resources. The additional contribution of moderately beneficial, long-term impacts from NPS stabilization and rehabilitation of historic structures would produce a net minor, beneficial cumulative effect on the visual environment.

*Conclusion* – Overall, the Proposed Action Alternative would produce moderately beneficial, long-term, localized, impacts on visual resources. Implementation of the Proposed Action would likely contribute moderately beneficial, long-term, localized cumulative impacts on visual resources.

### 4.4.8 Visitor Use and Experience

Under the Proposed Action Alternative, facilities and services to accommodate an increasing number of visitors to Kennecott-McCarthy would be expanded. A sign would welcome visitors to the area and information on services and activities would be improved and made more accessible. Incidents of accidental trespass on the patchwork of private property in the area would likely diminish somewhat because of more readily available information about land ownership patterns. The McCarthy Road Information Station along the McCarthy Road west of the Kennicott River would be better identified and made more visible to arriving visitors. Also, NPS would attempt to augment the number of hours the McCarthy Road Information Station is staffed.

Under proposed parking and shuttle arrangements, reaching the NHL from the Kennicott River should no longer be so time-consuming or inconvenient for visitors. The Proposed Action would aim to resolve confusing parking arrangements at the river that have led to conflicts on occasion. Greatly expanded parking at the McCarthy Road Information Station and shuttle service to the west bank of the Kennicott River would facilitate convenient access to the east side of the river, and McCarthy and Kennecott beyond.

Other elements of the Proposed Action, such as partnering to place panel information at the State's fire-wise pavilion west of the bend in the road, development and introduction of a comprehensive sign and wayfinding system, and development of a traveler information system at Long Lake for local AM-FM broadcasting, would also serve to enhance the quantity and quality of information available to visitors.

Constructing a new trail to the NHL that follows the east side of Kennicott River and parallels the Kennicott Glacier, with links to the Root Glacier trail and the walk-in campground, would enhance recreation opportunities for park visitors. If successful, efforts to establish partnerships to maintain existing trails in the area such as Jumbo, Bonanza, and Root Glacier would also be a benefit for visitors, as would placement of more toilets at parking areas, trailheads, and along NHL trails.

Overall, the Proposed Action would certainly improve and enhance the current visitor experience and would aim to meet the various needs of growing visitation to the area. Unlike the No Action Alternative, it could realistically achieve WRST's Mission Goal IIa (*Visitors safely enjoy and*

*are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities*), as well as pursue Mission Goal IIb (*Park visitors and the general public understand and appreciate the preservation of parks and their resources for this and future generations*). Therefore, the Proposed Action Alternative would have moderately beneficial, long-term impacts on visitor use and experience at Kennecott.

*Cumulative Impacts* – The principal outcome of other actions such as the McCarthy Road upgrade, increasing private sector investment in lodging and other tourism ventures, and the new walk-in campground will be to foster growth in the number of visitors coming to McCarthy-Kennecott. The cumulative impact of these actions on visitor use and experience would be moderately beneficial, in that the area does not appear to have reached its theoretical recreational carrying capacity. The Proposed Action would contribute moderately to beneficial cumulative impacts on visitor use and experience by expanding the capacity of facilities and services to meet the needs of more visitors.

*Conclusion* – The Proposed Action Alternative would have a moderately beneficial, long-term impact on visitor use and experience at the Kennecott area of WRST. In addition, it would interact with other ongoing and future actions to generate moderately beneficial, long-term cumulative impacts.

### 4.4.9 Transportation and Access

As listed in Section 2.2.10, the Proposed Action would take a number of steps to address transportation-related challenges in the McCarthy-Kennecott area:

- NPS would participate in road maintenance between the NHL and the Kennicott River by means of cooperative agreements with ADOT&PF and local landowners to confront inadequate maintenance and safety issues in this one-lane road segment.
- NPS would work with ADOT&PF to develop intervisible pullouts and other road design features to improve traffic flow and safety.
- The Wagon Road would be marked for visitor and local use, retaining its historic character as a wagon road.
- Shuttle van service to the NHL from the Kennicott River would be increased. NPS would institute Incidental Business Permits for public shuttles entering the NHL and seek to provide subsidies to help support their operation.
- Vehicle parking west of the Kennicott River would expanded and improved by building a much larger lot at the McCarthy Road Information Station.
- Vehicle parking east of the Kennicott River would include development of new private parking and develop parking for 30 cars on NPS land at the “boneyard” concealed behind the railroad berm.
- Within the Kennecott NHL, NPS would work on developing an MOU with all landowners to clarify and designate where parking could and could not occur.
- A designated turnaround/visitor drop-off would be developed at the Gagnon property above the Dairy Barn.
- NPS would encourage and support bicycle rentals in the McCarthy-Kennecott area.

While the Proposed Action Alternative may not succeed in resolving all transportation issues in the McCarthy-Kennecott area, it would constitute a moderately beneficial, long-term impact on transportation and access.

*Cumulative Impacts* **–** The most important implications for cumulative transportation-related impacts derive from the proposed McCarthy Road upgrade and other private-sector and NPS investments, all of which would have the net effect of increasing visitation and traffic in the McCarthy-Kennecott area. The former action would improve the McCarthy Road, increase safe travel speeds, enhance interpretive and recreational opportunities, and overall, facilitate greater visitation. NPS work in the NHL and private-sector investment in tourist lodging and outings would also attract more visitors and traffic to the area.

Cumulatively, these other actions would likely result in a long-term, moderately adverse impact on transportation and access in the area. However, because the Proposed Action Alternative focuses on addressing existing and projected transportation-related deficiencies, it should be able to accommodate increasing visitation and traffic in the area while still improving existing transportation-related problems. Overall then, the long-term cumulative impact on transportation of the Proposed Action combined with other actions would be minor and beneficial.

*Conclusion* **–** The Proposed Action would result in long-term, moderately beneficial impacts on transportation and access in the McCarthy-Kennecott area. Cumulative impacts from other actions by themselves would be moderately adverse and long term. Overall cumulative impacts, combining both the Proposed Action and other actions, would be beneficial, minor, and long term.

### 4.4.10 Utilities and Related Services

Under the Proposed Action Alternative, a number of NPS utilities and services would be improved or expanded to meet standards and rising demands:

- NPS would approve the concept of hydroelectric development in Bonanza Creek and authorize more detailed analysis of the engineering aspects and environmental effects of this concept; until any such development occurred, NPS would maintain the existing power supply system (diesel generator and underground lines) within the NHL.
- NPS would expand two existing septic systems in the NHL to handle anticipated increases in visitation and new facilities that would be connected to these systems.
- NPS would develop both a drinking water well and septic system for the Herben Cabin in McCarthy.
- Limited fire suppression capabilities in the NHL would be expanded and improved to safeguard both humans and historic structures from fires.
- NPS would dig two production wells in the NHL to supply drinking water.
- A more comprehensive waste management system would be implemented (ideally in conjunction with the town of McCarthy), beginning with the development of a transfer station at the DNR firewise pavilion.

Overall, these actions would constitute a moderately beneficial, long term impact on utilities and related services in the area.

*Cumulative Impacts* **–** Rising visitation to the area, encouraged by other actions, would increase the demand for utilities and related services locally. This would constitute a moderately adverse, long-term impact. However, with implementation of the Proposed Action Alternative, it is unlikely that there would be shortages or supply interruptions.

*Conclusion* **–** The Proposed Action Alternative would result in long-term, moderately beneficial impacts on utilities and related services in the McCarthy-Kennecott area. Cumulative impacts from other actions would be moderately adverse. In combination, the Proposed Action and other actions would probably offset one another, resulting in negligible cumulative adverse impacts on utilities and related services over the long term.

### 4.4.11 Socioeconomic Environment

The Proposed Action Alternative would have a minor to moderately beneficial direct effect on the socioeconomic environment of the McCarthy-Kennecott area. It may lead to short-term increases in employment opportunities related to construction projects that would occur under this alternative. This would in turn inject new funds into the local economy from direct and indirect spending on goods and services. Because NPS would aim to provide housing for its own workers and contractors, the Proposed Action would probably not place excessive burdens on housing or other locally provided services. Indirectly, the Proposed Action would result in moderately beneficial long-term impacts for the local community, by furnishing the necessary infrastructure, facilities and services to accommodate projected growth of tourism in McCarthy-Kennecott and visitation to the NHL.

*Cumulative Impacts* – As described elsewhere, other reasonably foreseeable actions would have the net effect of increasing tourism in the area and visitation to the Kennecott NHL. McCarthy residents appear generally supportive of this prospect, provided that it is well planned and provided for and that their concerns are addressed. Thus, cumulatively, these other actions together would create a moderately beneficial, long-term impact for the socioeconomic environment of the McCarthy community. The Proposed Action would contribute substantially to these long-term, cumulative socioeconomic benefits for the surrounding area.

*Conclusion* **–** The Proposed Action Alternative would result in long-term, moderately beneficial impacts to the socioeconomic environment of the McCarthy-Kennecott area. When considered in combination with the other actions, the Proposed Action Alternative would add to beneficial cumulative impacts on the socioeconomic environment.

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# 5.0 CONSULTATION & COORDINATION

## 5.1 PUBLIC INVOLVEMENT

NPS kicked off planning for the Kennecott Mines Support Facilities Plan Environmental Assessment in September 2004, by eliciting the input of the local McCarthy-Kennecott community and interested citizens in Anchorage. Advertised public scoping meetings were held in both locations to solicit the public's ideas, concerns, and suggestions. At the September kick-off events local residents and Alaskans provided helpful comments on where they thought employees should be housed, where visitors should camp, how to provide electricity, water and other utilities; they also suggested different ways that construction supplies could be freighted and stored and how run a shuttle system (NPS, 2005f).

Over the winter, the Kennecott planning team utilized these comments to develop a range of alternatives which were presented in a newsletter distributed to the public in April 2005. McCarthy and Anchorage residents once again took the time to evaluate these alternatives and provide input as to which alternatives they preferred at two public meetings held in April.

Several dozen people participated in the scoping meetings and draft alternatives review meetings in McCarthy and Anchorage.

This EA represents the third opportunity for public involvement in the planning process.

Table 5-1 lists the both the preparers of this document and the agencies, organizations, and persons contacted for information. These individuals and organizations assisted in identifying issues, developing alternatives, and analyzing impacts of the alternatives.

**Table 5-1. List of Preparers and Persons and Agencies Contacted**

| Person Contacted | Agency/Organization |
|---|---|
| Dwayne Adams, Landscape Architect | Land Design North, Anchorage |
| Peter Briggs, Landscape Architect | Land Design North, Anchorage |
| Geoff Bleakley, Historian | U.S. Department of the Interior (DOI), National Park Service (NPS), Wrangell-St. Elias National Park (WRST), Copper Center, Alaska |
| Terry Humphrey, Planner | DOI, NPS, Alaska Regional Support Office |
| Steve Hunt, Environmental Specialist | DOI, NPS, WRST |
| Ken Hutchison, Kennecott Project Manager | DOI, NPS, WRST |
| Leon Kolankiewicz, Mangi Project Manager | Mangi Environmental Group, McLean, Virginia |
| Tim Marshall, Archaeologist | DOI, NPS, WRST |
| Eveline Martin, Environmental Analyst | Mangi Environmental Group, McLean, Virginia |
| Marshall Neeck, Kennecott District Ranger | DOI, NPS, WRST |
| Steve Peterson, Historical Architect | DOI, NPS, Alaska Regional Support Office |

| | |
|---|---|
| Heather Rice, Environmental Protection Specialist | DOI, NPS, Alaska Regional Support Office |
| Vicki Snitzler, Planner | DOI, NPS, WRST |
| Will Tipton, Chief of Maintenance | DOI, NPS, WRST |
| Rebecca Whitney, GIS Specialist | Mangi Environmental Group, McLean, Virginia |
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# APPENDIX A

## ANILCA Section 810(a)

## Summary Evaluation and Findings

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## ANILCA SECTION 810(a)

## SUMMARY EVALUATION AND FINDINGS

### I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluations of potential restrictions to subsistence activities which could result from the National Park Service (NPS) proceeding with the development and implementation of a Support Facility Plan for the Kennecott Mines National Historic Landmark in Wrangell-St. Elias National Park. Actions under this plan would support the capacity of NPS to preserve nationally significant historic resources at the former Kennecott Mine and Mill Town as well provide the for safety and enjoyment of an increasing number of visitors to the historic district and neighboring McCarthy, Alaska.

### II. THE EVALUATION PROCESS

Section 810(a) of ANILCA states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands … the head of the federal agency … over such lands … shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -

(1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the national park system in Alaska. Wrangell-Saint Elias National Park, containing approximately eight million one hundred and forty-seven thousand acres of public lands, and Wrangell-Saint Elias National Preserve containing approximately four million one hundred and seventeen thousand acres of public lands, was created by ANILCA, section 201(9), for the following purposes:

"To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes, and streams, valleys, and coastal landscapes in their natural state; to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals; and to provide continued opportunities including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the park, where such uses are traditional, in accordance with the provisions of Title VIII."

The potential for significant restriction must be evaluated for the proposed action's effect upon "…subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use."

## III. PROPOSED ACTION ON FEDERAL LANDS

The National Park Service is considering two alternatives for a Support Facility Plan at the Kennecott Mines National Historic Landmark (NHL). A full discussion of the alternatives and their anticipated effects is presented in the attached Environmental Assessment (EA). The alternatives are summarized briefly below with particular attention to subsistence resources.

**No Action Alternative**: Only existing or already planned and approved facilities, infrastructure and services related to NPS operations at Kennecott would occur.

**Proposed Action Alternative**: The NPS would implement a number of actions that would expand its ability to preserve and manage the Kennecott Mines NHL while meeting the needs of a projected increase in the number of visitors to Kennecott and neighboring McCarthy. These actions would expand NPS housing; modify existing construction materials storage arrangements; provide for expanded and reliable energy supply, both for electricity and space heating; increase wastewater treatment capacity; improve fire suppression both to protect human life and irreplaceable historic structures in the NHL; expand the supply and reliability of drinking water; implement more comprehensive solid waste management; significantly augment visitor amenities; reduce the encroachment of National Creek on historic structures within the NHL; and improve transportation infrastructure for the safety and convenience of motorists, pedestrians and bicyclists.

## IV. AFFECTED ENVIRONMENT

A summary of the affected environment pertinent to subsistence use is presented here. The following documents contain additional descriptions of subsistence uses within Wrangell-St. Elias National Park and Preserve:

*General Management Plan/Land Protection Plan, Wrangell-St. Elias National Park and Preserve*, NPS Alaska Region, 1986.

*Final Environmental Impact Statement, Wilderness Recommendation*, NPS Alaska Region, 1988.

*Wrangell-St. Elias Subsistence Management Plan*, NPS Alaska Region, 1998.

Subsistence uses are allowed within Wrangell-St. Elias National Park and Preserve in accordance with Titles II and VIII of ANILCA. The national preserve is open to federal subsistence uses and state authorized general (sport) hunting, trapping and fishing activities. Qualified local rural residents who live in one of the park's 23 designated resident zone communities or have a special subsistence use permit issued by the park superintendent may engage in subsistence activities within the national park. State regulated sport fishing is also allowed in the national park. The proposed action falls within the national preserve, although the Kennecott-McCarthy area is located within approximately 10 kilometers of national park lands to the north and east. Federal subsistence regulations are not applicable to state land, native allotments and other private inholdings in the area.

ANILCA provides a preference for local rural residents over other consumptive users should a shortage of subsistence resources occur and allocation of harvest becomes necessary. This is particularly important for national preserves where State subsistence fishing and hunting is allowed in addition to Federal subsistence fishing and hunting. When the harvest must be limited, State subsistence and general fishing and hunting opportunities must be restricted first before any reduction in the harvest for federal subsistence users occurs.

The park's main subsistence resources are salmon, moose, caribou, Dall sheep, mountain goat, ptarmigan, spruce grouse, snowshoe hare, furbearing animals, berries, mushrooms, and dead and green logs for construction and firewood. Rural residents in the McCarthy-Kennecott area harvest moose, black bear, snowshoe hare, spruce grouse, and blueberries for subsistence purposes. Collection of firewood also occurs.

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerable from previous years due to weather conditions, migration patterns, and natural population cycles.

## V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources which could be impacted.

The evaluation criteria are:

1. the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;

2. what affect the action might have on subsistence fisher or hunter access;

3. the potential for the action to increase fisher or hunter competition for subsistence resources.

The potential to reduce populations:

Neither the No Action nor the Proposed Action alternatives are likely to have any effect on fish habitat or fish populations, because very little or no proposed work would occur in or next to streams that support fish.

Subsistence wildlife species and habitats would be subjected to minimal potential impacts and disturbances as a result of the actions proposed under both the No Action Alternative and the Proposed Action Alternative. Most construction and development under both alternatives would take place in already developed sites. Under the Proposed Action the total area of existing wildlife habitat permanently impacted would amount to approximately 3-4 acres, which would be used for NPS housing adjacent to the existing Operations Support Complex, an expanded parking lot at the west side McCarthy Road Information Station, and development of the walk-in campground near the McCarthy Airport. For the No Action Alternative, which would provide the additional NPS housing and the walk-in campground, but not the expanded parking lot, the acreage of habitat conversion would be less.

The construction or installation of new housing in the west side Operations Support Complex, buried propane tanks, well and septic systems, buried water lines, water tanks, water containment structure, vault toilets, trails, and parking lots would cause temporary to short-term displacement of wildlife during periods of construction activity and permanently decrease available wildlife habitat in small, localized areas. The indirect impacts of short-term habitat losses are decreased availability of food and prey species, temporary changes in wildlife distribution, increased competition for food, inefficient use of habitat, and altered movement and activity patterns. Wildlife could be disturbed and displaced by the noise and activity surrounding construction sites for up to eight hours per day for as long as it takes to complete the work (several days to several months). Concentrating human use in wildlife habitat during construction, and subsequently visitor use, could permanently displace some species of important for subsistence, but it is unlikely that habitat would be rendered non-functional or that any species' population as a whole would be extirpated from the area as there would remain many areas that humans do not concentrate in.

Impacts to subsistence wildlife from new trails would be primarily behavioral responses to approaching hikers and from habitat alterations, habitat fragmentation, and any habitat loss due to trail construction. Behavioral responses may include flight from approaching hikers, avoidance of trail areas, habituation to humans, association of humans with food, and adjustment of timing to activities such as feeding. Behavioral responses are of short duration, only having an impact while the particular behavior is elicited. However, prolonged or repeated disturbance may lead to long-term or permanent disruptions, particularly if the response disrupts breeding, displaces wildlife from critical resources, reduces rearing success, or alters mortality rates through factors such as predation and defense of life and property (DLP) killings of bears. New trails could also potentially impact wildlife travel corridors, and fragmented habitat could facilitate the encroachment of edge species.

The Proposed Action Alternative could reduce the potential for human-bear conflicts with improved solid waste management. However, increased visitation, which may occur from

improved visitor services, could increase bear attractants (food and food odors) and, subsequently, occurrences of human-bear conflicts. If human-bear conflicts increase, the result could be increased direct and indirect injury and mortality of black bears, which are hunted locally for subsistence.

Overall, mobile wildlife species, including most subsistence species, would avoid any areas undergoing construction activity, and no long-term impact is anticipated. In sum, the proposed alternatives are not expected to significantly alter wildlife movements or reduce populations of important subsistence resources. The amount of potential habitat reduction is quite limited when compared to the overall size of the national park and preserve.

Beyond this, NPS regulations and provisions of ANILCA provide the tools for adequate protection of fish and wildlife populations on federal public lands while ensuring a subsistence priority for local rural residents. NPS regulations allow the superintendent to enact closures, restrictions, or both if necessary to protect subsistence opportunities and ensure the continued viability of particular fish or wildlife populations.

In sum, construction of new facilities planned under the Proposed Action Alternative would remove small amounts of suitable wildlife habitat for species used by local residents for subsistence purposes. However, the habitat loss would not affect local wildlife populations significantly. There would be some loss of berry-bearing vegetation; however, soapberry is not used for subsistence and blueberry is common and widely available in the area.

The effect on subsistence access:

All rights of access for subsistence use on NPS lands are granted by section 811 of ANILCA. Neither alternative discussed in this analysis would have a measurable impact on subsistence access.

The potential to increase competition:

Competition for wildlife or other resources is not expected to significantly impact subsistence users as a result of either the No Action or Proposed Action alternatives. No significant increase in competition for subsistence hunting would be expected from either alternative. Although the Proposed Action Alternative in particular is intended to accommodate increasing visitation to the Kennecott NHL, these visitors would be oriented primarily toward exploration and appreciation of historical and cultural resources in the area, and secondarily toward the wilderness setting and scenery generally, and not toward subsistence hunting opportunities. Any increase in berry picking by recreational visitors over and above the current situation is anticipated to be minimal. Finally, neither alternative would be expected to result in significant growth in the population of residents in the area – and therefore the number of potential subsistence users – at least over the foreseeable future.

National Park Service regulations and ANILCA provisions mandate that if and when it is necessary to restrict taking of fish or wildlife, subsistence users are the priority consumptive users on federal public lands and would be given preference over other consumptive uses

(ANILCA, section 802(2)). Continued implementation of the ANILCA provisions should mitigate any increased competition from resource users other than subsistence users. Therefore, neither alternative is expected to adversely affect resource competition.

## VI. AVAILABILITY OF OTHER LANDS

No other lands would satisfy the goal of providing the infrastructure, facilities, and services needed to protect the National Historic Landmark and support NPS operations and visitation to the McCarthy-Kennecott area. All of the sites proposed for construction and improvements are either in or adjacent to already developed areas or located at sites selected to minimize their impacts (like the walk-in campground). Siting the proposed developments at more distant, less disturbed locations would likely result in greater impacts than building in and next to existing developed sites. Additionally, other federal public lands both within and outside of the park and preserve are available for subsistence.

## VII. ALTERNATIVES CONSIDERED

The EA and this evaluation have described and analyzed the No Action and Proposed Action alternatives. These alternatives are consistent with NPS mandates and the General Management Plan for the park and preserve. No other alternatives that would reduce or eliminate the use of public lands needed for subsistence purposes were identified. It is possible for subsistence users to utilize other lands inside and outside the park and preserve. Subsistence users extend their activities to other areas as necessary to obtain subsistence resources.

## VII. FINDINGS

This analysis concludes that neither the No Action Alternative nor the Proposed Action Alternative will result in a significant restriction of subsistence uses.